MUNICIPAL JOURNAL AND ENGINEER

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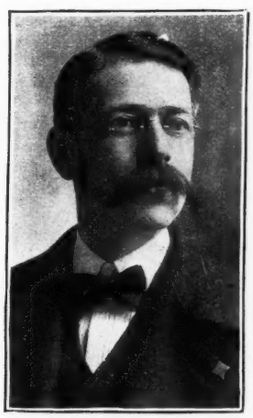
VOLUME X NEW YORK, MAY, 1901 No. 5

SUCCESSFUL MUNICIPAL LIGHTING.



A. E. WINCHESTER,
General Superintendent.

THE little city of South Norwalk is rounding out the first decade of Connecticut's initial venture in municipal lighting. Ten years ago the citizens became dissatisfied with the poor service of a private corporation. Patience ceased to be a virtue, and a thorough investigation demonstrated the possibility of a municipal plant which would furnish light at a reduced cost. In two years from that date the dream was realized—the city secured a 1,400 candle power arc light at the rate of $66 per year, when it had been paying a private corporation at the rate of $83 per arc lamp of 800 candle power. After eight years of service the city is more than ever satisfied with its municipal lighting venture.

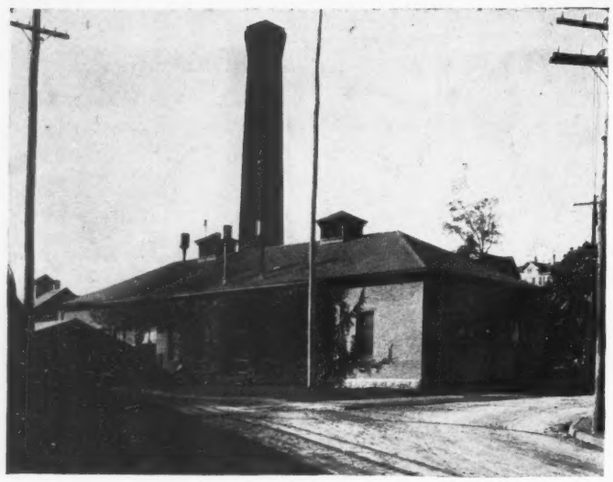
The orignal plant cost $22,500 and was constructed under the supervision of Albert E. Winchester, who has since been one of the commissioners and the general manager. It is not too much to say that the satisfactory results are due to the excellent work of Mr. Winchester, who had received his training in years of practical service with private corporations.

The first plant provided for the street lighting only, but this was so successful in its operation that the public demanded a commercial system. In due time $20,000 was appropriated for this purpose, and on the evening of August 1, 1898, commercial light was first supplied to an encouraging number of consumers. A fixed rate for the street lighting service had been established from the beginning, and General Manager Winchester extended the commercial service upon a business basis. Believing the installation and maintenance of meters would be too heavy an expense for so small a plant to carry, and having some ideas of his own as to how electric current should be sold, he evolved what is known as the Winchester System for regulating the price of commercial lighting. This plan is fully described in the supplement issued with this number. It was so successful at South Norwalk that it has been adopted not only by municipal plants, but also by several private corporations.

In less than a year after the installation of the commercial lighting system, the demand exceeded the supply. The commissioners were confronted with a proposition to enlarge the plant once more, which, after due consideration, was decided as essential to its success, whereupon $17,500 were appropriated by the Council for the proposed improvement. The private corporation which had formerly had the contract for street and commercial lighting, seeing in this movement a menace to its own life, endeavored to stem the tide of popular approval by a resort to the courts, and so prevent further extension of the municipal system, but without success. The second enlargement was made and the plant is now in operation.

As will be seen by the accompanying illustrations the building is a substantial brick structure, practically fireproof, with a slate roof. It is one and a half stories high, of rectangular form, forty-eight feet wide by 109 feet long, with a one-story coal house extension of 100 tons storage capacity, opening into the fire room. On the west side is located a battery room, which operates the fire alarm system of the city, a repair room, with benches, tools, oil tanks, etc.,

COMMISSIONERS' OFFICE, SOUTH NORWALK PLANT.

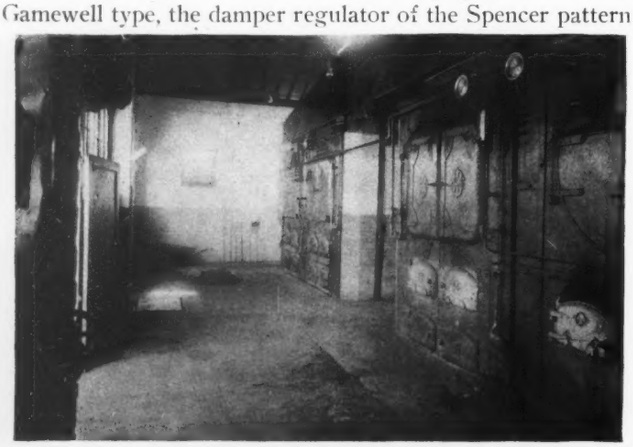


POWER STATION, SOUTH NORWALK PLANT.

a test room through which all circuits pass, containing a photometer, and other testing appliances, and last, a stock-room for the storage of supplies.

The main interior of the building is divided by a fire wall into engine and boiler rooms, the latter containing a battery of four 125 h. p. horizontal tubular boilers, made by the Harrisburg Foundry and Machine Company and Watertown Engine Company, each 6 by 16 feet, and set with fuel economizers. The plant is equipped with the American feed water heaters, an injector, a fire hose, coal weighing scales, and an iron smoke flue leading from the boilers to the 500 horse-power brick chimney.

The engine room, which is connected with the boiler room by a large sliding door, contains a 100 h. p. "Ideal" high speed engine, made by the Harrisburg Foundry and Machine Company, belted direct to two sixty light "Western Electric" arc dynamos. These dynamos are provided with divided fields and shunt switches, by which the lamps can, at the will of the operator, be made to produce from 1,200 to 2,000 nominal candle power. This room also contains four 100 h. p. "Watertown" high speed engines, made by the Watertown Engine Company, connected direct to four sixty K. W. compound 220 volt maultipolar dynamos; two of the dynamos are of the Siemans & Halske and two of the Eddy types. The large, fully equipped, marbleized slate switch-board was partly constructed by the Eddy Company and partly by Siemans & Halske. The fire alarm equipment is of the Gamewell type, the damper regulator of the Spencer pattern,



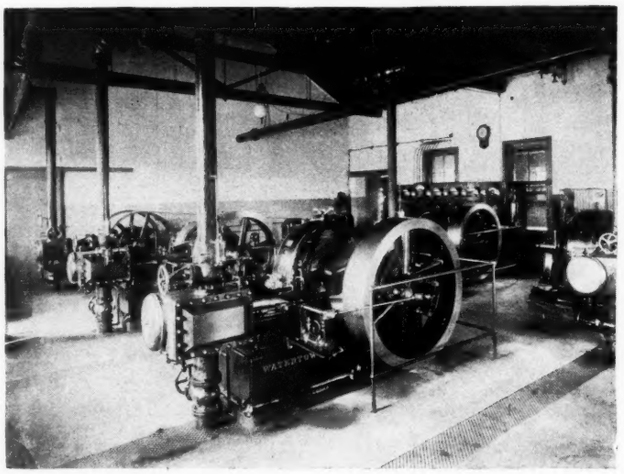
BOILER ROOM, SOUTH NORWALK PLANT.

and the two steam water feed pumps of the Worthington type.

At the front end of the engine room is a gallery, under which are the main entrance, general office, private office and dressing room. The offices communicate with each other and are well and appropriately furnished, while the dressing room contains individual lockers for the men, sink and toilet.

Fourteen electrical circuits radiate from the station throughout the city; two are high tension feeders, supplying all street arc lamps; four are low tension feeders to centres of distribution of the "crib" system of commercial mains; three are pressure wires from outside feeder ends; one is a service from the mains to light the station, and the remainng four are battery circuits of the fire alarm system of the fire department.

The executive staff consists of a non-partisan board of three electrical commissioners appointed by the Common Council, each for the term of three years, one commissioner being appointed annually. As commissioners the members of the board draw no salaries, but they have power to make



ENGINE ROOM, SOUTH NORWALK PLANT.

appointments from their own number to any position on the salaried list of the operating staff.

The operating staff is composed of the general superintendent, operating superintendent, two engineers, two linemen and trimmers and one fireman. All members of the force are chosen on the qualifications of merit only, and politics are strictly eliminated from the management of the affairs of the plant.

On the beginning of the New Year, by order of the Common Council, the schedule for the street lighting service was changed. Up to that date the lamps were lighted at dusk and extinguished at 1:30 A. M., except on special occasions. At the present time the service is from sunset to sunrise, and the rate charged per arc lamp has been advanced from $66 to $72.

The price which South Norwalk is paying for its light is slightly in advance of several cities which are served by private companies, who give a similar service, but who pay much less for coal. On the other hand, the vast majority of private plants receive a larger price per arc lamp for an all night and every night service.

The commercial lighting service starts as soon in the afternoon as the daylight begins to fade, and is continued until broad daylight. There are about 150 patrons of the incandescent lighting system.

The power circuit starts as early as required in the morning of each week day and continues until about midnight. There are fifteen patrons of this branch of the service.

The statistics relating to the plant are as follows:

STREET LIGHTING.

Capacity in 2,000 candle power open arc lamps	120
Number of circuits	2
Miles of wire in circuits, about	15
Average lamps in service during past year	100
Average distance between lamps in feet	500
Average nominal candle power per lamp	1,400
Number of nights lighted during the year	365
Hours of service per night; sunrise to sunset	

COMMERCIAL SYSTEM.

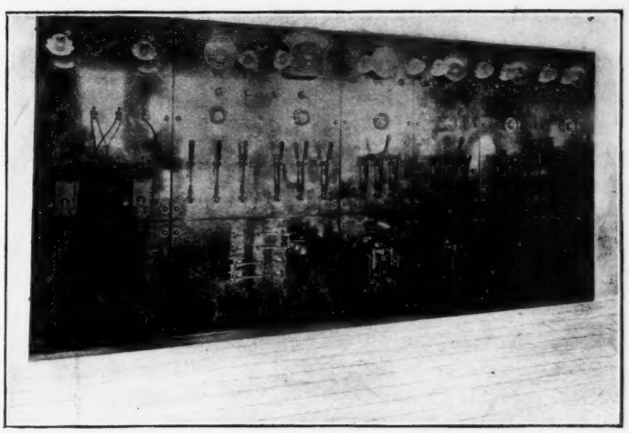
Capacity in 16 candle power lamps, nominal	4,000
Miles of wire in circuits, about	10
Lamps connected	2,934
Average hours of service per night, 365 nights per year	13.72

GENERAL.

Price of coal per ton, delivered	$3.40
Total output of the plant in kilowatt hours per year	300,433
Average rate received per kilowatt hour	$.0539
Cost per kilowatt hour	.0476

LAST FINANCIAL STATEMENT.

Resources.			
Balance in bank Oct. 13, 1899	$1,447.52		
Supplies on hand Oct. 13, 1899	440.00		
		$1,887.52	
Income from street lighting for year	$5,947.00		
Income from commercial lighting, etc., for year	10,261.98		
		16,208.98	
Total resources			$18,096.50
Distribution of Resources.			
Interest on $42,500.00 bonds @ 4%	$1,700.00		
New construction, repairs, running expenses and salaries	$12,249.16		
Supplies from last year	440.00		
	$12,689.16		
Supplies now on hand deducted	439.53		
Maintenance of electric light plant	$12,249.63		
Maintenance of fire alarm	387.80		
		12,637.43	
Total maintenance		$14,337.43	
Depreciation or Contingent Reserve Fund.			
Cash surplus Oct 12, 1900	$3,319.54		
Supplies on hand Oct. 12, 1900	439.53		
Total	$3,759.07		
Distribution of Above Fund.			
Paid on commercial enlargement notes	$2,500.00		
Supplies on hand	439.53		
Cash on hand	819.54		
Total		$3,759.07	$18,096.50
Profit for Year.			
Total expenditures	$14,337.43		
New construction deducted	225.51		
Fire alarm maintenance deducted	387.80	613.31	
Cost of operating electric plant for year	$13,724.12		
Cash on hand Oct. 13, 1899	$1,447.52		
Supplies on hand Oct. 13, 1899	440.00	$1,887.52	$15,611.64
Net profit for year ending Oct. 12, 1900, exclusive of interest			**$2,484.86**



THE SWITCH BOARD, SOUTH NORWALK PLANT.

The total assets of the plant, including real estate, buildings, equipment, supplies and cash on hand, amount to $64,244.89. This does not represent its true value, which should be based upon its earning capacity. Such a valuation would increase the above amount considerably. The liabilities include the interest bearing investment, which amounts to $57,500, and an allowance of 5 per cent. for depreciation, which is 2,875, making a total of $60,375.

There is much to commend in this municipal undertaking, but there is an opportunity for improvement. Compared with a plant of about an equal capacity in a city of 5,000 population in Ohio, this plant cost too much to construct and equip, and there does not appear, from the report and a general observation of the field covered, to be the need for seven men on the operating force. The plant could be operated with four men, but, of course, it would keep them busy all the time. It is possible that the liberal policy marked out by the Electric Light Commissioners of South Norwalk, all things considered, is the better one. At any rate, that city is not alone in the practice of not overworking its employees, for there are scores of others which are even more liberal.

A PARK LIBRARY IN BROOKLYN.

THE Brooklyn Public Library initiated a Park branch for the benefit of the patrons of Prospect Park last season, and the results were so satisfactory as to warrant its continuance during the coming season. One of the rooms of the Litchfield Mansion, the Administration Building of the Park Police and other officials, was used for housing the books. These were 250 in number, and consisted of standard works on natural history by such authors as Agassiz, Abbott, Burroughs, Thoreau, Du Chaillu, Guyot, and Thompson. As the library was small, the open shelf system was used. Few books, however, were lost. Anyone could select a book, take to the librarian, and after having it charged, keep it for the day or longer. Many kept the books only during the day, turning them in on leaving the park in the afternoon. A few magazines were also on a table in the room, but could not be withdrawn. The small library of 250 books is known in the Brooklyn system as a "traveling library." During the summer about 3,000 books were added, and what is known as a Branch Library established. This, however, is to be removed soon to quarters outside the park, and only the books on natural history will be kept in the park.

SIGNIFICANCE OF NEW YORK'S NEXT ELECTION.

BY THOMAS R. SLICER, D. D.

A critic of American institutions has said that the United States is the country in which the experiments of the old world are tried over again on a large scale. One successful experiment in English and Continental cities we have scarcely begun to try, and that is the placing of municipal affairs upon a basis of business pure and simple. By pure we do not mean without defect, and by simple we do not mean that the experiment is not complicated by many considerations. But the administration of a city's affairs is not an experiment in political science in the first instance. The relation of the city to the state of course does involve it in political considerations; but the city considered in itself, is simply a corporation of immense proportions, centralized business, and incalculable influence.

Let us take the date April 19th in 1861. The transaction which most fixes that date in the mind is the attack upon the soldiers of the Sixth Massachusetts Regiment in the streets of Baltimore by an ill-governed mob. That was a political event; but the mob itself was the result of a political administration of the city through a long series of years. Every local election had been a contest between political clubs—a contest so sharp and disorderly that the public schools for several years prior to the date in 1861, were closed on election days, and most people who were not actual voters kept to their houses. These political clubs represented the contending political parties. The attack on the Massachusetts troops was simply an incident in a city where mob rule had exceeded the power of the city to control.

April 19th, 1901, forty years later, in the City of New York, is marked by the largest stock and bond sale known in the history of American finance in a single day. The operations of the Stock Exchange represented an aggregate of more than two million shares and a par value of more than seven millions in money. Here also the relation of political influence to municipal administration appears; for this tremendous aggregate of business in a single day represents the confidence and security of the nation in the business prospects of the whole country.

But the tremendous business transactions referred to are only floated above the peradventure and mischance of local municipal rule by a tide of conviction that sooner or later the unsafe and immoral administration of the city's affairs shall be relieved by a business administration which shall represent no party, but represent the interests of all people. If this should ever supervene as a condition in New York City, it will mark the successful issue of an experiment which, as we said at the beginning, has been worked out in many cities of the United Kingdom and in some cities of the Continent.

As the matter now stands, the administration of the city of New York, with one exception the greatest commercial center in the world, imperils the rights and opportunities of the three and a half millions of people living within Greater New York, by making them dependent upon the caprice of political parties which carry on the blundering game of trying to offset local conditions by legislative action.

It cannot be said to be a good example in political science for a great municipality like New York to depend upon State legislation for its safety; and the example is still further impaired by the fact that that safety is not insured by the very dependence to which it turns. The action of the legislature, notably in the charter just amended and passed, is as perilous to the city as though the city were left to its own resources. It was vetoed by the Mayor, and waits at this writing further tinkering and cobbling to bring it back to what a commission of citizens had made it.

The situation between city and state might be aptly illustrated by a ship which is leaking like a sieve, while an idle crew stands by, and is only saved from sinking by an imported crew, who keep up the action of the pumps, and yet the dry dock is within an hour's sail, where the leaks might be stopped.

This conflicting action of political parties interfering with a simple business administration will never cease until it is understood that every aspect of a city's life is part of a business proposition, in which all parties sink their differences in order to carry on a successful municipal administration.

New York is separated by a few months from a great municipal campaign, and the complex conditions which confront the city might be easily resolved if all citizens who understand business methods would apply business methods to the complications surrounding this contest.

It is credibly stated, and figures are given to prove the statement, that in three years the administration of the City of New York has increased in expense thirty per cent.; that is, the cost of administrating the city's affairs is nearly one-third more than it was three years ago. The statement of active business men that they "can make more in a given time than the other fellow can steal," is as undignified as it is fallacious. Few men of great enterprise can add thirty per cent. to their working power; and even if they could, the statement loses sight of two important facts; one, the centralization of power in the hands of a few, which leaves a vast army shorn of their initiative; and the multitude of those who have neither initiative nor power, but who must be carried as the common people, for whom those in power are bound to provide protection, opportunity, and sanitary conditions, that they may work out their little scheme of life unhindered and unimpeded.

So it may be safely said that the municipal conflict is a conflict of business interests and not of party politics; and that the controlling and determining element in the municipal election of 1901 in its last anaylsis, will be seen to be whether the greatest business center of the world shall show itself to be a carcass to be picked clean by the jackals of cunning, or whether it shall be a great commercial enterprise, administered by dignified and capable business men.

An ocular demonstration might be made for the citizens of New York by having them pass in procession through three great rooms, in the first of which should be gathered the leaders, henchmen, and heelers of the present municipal administration, running all the way from the officials of the City Hall and of the Police Department to the employees of pool-rooms and saloons, who are placed by the district leaders where they can do the most good to the local political situation of their election district. This might be the first group.

In the second room, as the procession passes, might be assembled those who undertake to administer the destinies of the city by making it the focus of political interest of the two great parties, Republican and Democratic. In this group would appear only the professional politicians of both parties—men who hold no office in the city, but whose trade is politics; men who represent no great business enterprise in the city that is unconnected with political advancement.

In the third room, as the procession passes, might be assembled the great merchant class; the professional life of the city of New York; its masters of industry; its men of great business enterprise; presidents and directors of banks; the Napoleons of finance; the leaders of the great laboring class; the men who spend their lives in the interpretation and practice of the law; the skilled physicians; and in this class there might be also placed, as a kind of well-meaning, but somewhat ineffectual group, the scholars, clerical and lay, who constitute the city's moral teachers.

We cannot help but feel that, judged simply by their physiognomy, the lines that life has left in their faces, by the purpose that shows in their eyes, without any knowledge whatever of their personal history, the moving procession of New York's great voting class would feel that its interests were safer in the hands of the executive, administrative, enterprising, business community than in either of the two classes first named.

If the municipal election shall leave the city in the hands of its present holders, then we shall enter upon another term of the most unbusinesslike and perilously expensive procedure that any city could be cursed with, namely, a studious, unresting effort to satisfy the hunger of the spoilsman, who levies a tribute upon every department of life. The company that wants a franchise will then make the best terms it can in getting it. The corporate interests of the community must wait upon the decision of people who can scarcely add up a column of figures. The tremendous interests involved in the whole system of public education must tremble between the anxieties of those who understand the subject, and the demands of those who wish to make it a part of the political game. And out of his seething contention of business that tries to save itself by satisfying its invaders, every now and then will be seen a melancholy procession of men who appeal to the legislature to come to their aid by invading the home rule of the great city by special legislation.

Public attention is now fixed upon the protection of vice by the police force; but not sufficient weight is given to the fact that this protection belongs to the average citizen; for the city as a whole pays a lump sum annually of eleven million dollars, an excess of expense for police administration almost startling, as compared with the amount paid in the city of London, where the police force is twice as great, namely, 15,000 men; where the population is larger by nearly one and a half milions, and where the cost is one-third less.

For two years the city has been convulsed by anxiety lest the supply of water should be insufficient for the city's needs; and recurrent panics, almost humorous in their frequency, have been instigated by officials who would have us believe that unless a rain-fall occurred within forty-eight hours parts of the city would be reduced to calculate their water supply in pints. Then kind Heaven has sent a rain-fall of about one and one-half inches of water, and the reservoirs have overflowed, and the lying officials have been contradicted. So general has been the conviction that this whole matter was fraudulent that the whole water question has been summed up in the phrase, "Ramapo steal."

But the Ramapo Company would have been impossible without the legislature, and the only hindrance to its success was the single vote of the Controller of the city a year ago last August. And when the crisis was at its height, it was a business proposition whether the city should be involved in an expenditure of two hundred million dollars for a supply of water which could not be delivered until three years from that time, if it could be delivered at all; and in the meantime the unbusinesslike aspects of the whole situation appear in the fact that public officials could not be impressed, refused to hear, utterly repudiated the fact, that an average consumption of water of one hundred and twenty gallons per capita, required explanation, as contrasted with those cities of Europe, where proper oversight was exercised as to supply and leakage, and in which the per capita consumption was in some instances less than thirty gallons daily. The inanity of this attitude toward a great necessary of life can only be explained by the prevailing delusion that the administration of the city is part of a political game, and in no sense a business for business-men to determine.

In the municipal contest of the coming autumn, every other question should be subordinated to the business interests of this vast aggregation known as Greater New York. There are probably five hundred men in the city of New York competent to take the place of Mayor of the city, whose competency consists not in their knowledge of party politics, but in their knowledge of business methods.

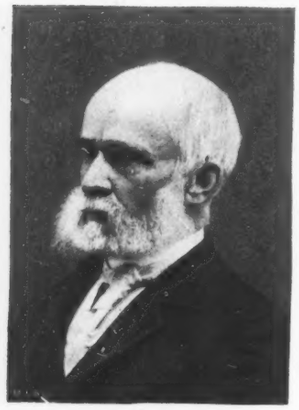
When an English city makes its chief dependence its City Clerk, it selects the most capable man that can be found among its people, puts him into office for an indefinite tenure, and pays him ten thousand dollars salary, simply because he knows what the business interests of the city require. In contrast with this, a great city like New York will speculate as to the "acceptability," "availability," "popularity," "political following" of individuals who may be put in this or that position of responsibility, who are likely to carry their party ticket; and they may be as incompetent for the duties of the office to which they aspire or to which their party promotes them, as they are incapable of appointing to the minor places men who will make up for the ignorance at the head of the administration.

One does not know in a city like this which most to deplore—the infatuation of the common people with party leaders, or the imbecility of the leaders in the selection of their lieutenants. The correction will come when two things take possession of the public mind: First, that municipal administration is business and not politics; and secondly, that in the political game the common people pay all the losses, and the gains are divided between the holders of the offices and the parties to which they belong.

The municipal contest of 1901 will furnish a fresh illustration of the remark of the critic before mentioned, who said that America is the place in which the experiments of the past are tried over on a large scale.

THE JAMES BLACKSTONE MEMORIAL LIBRARY.

BY H. M. WHITNEY, LIBRARIAN.



H. M. WHITNEY,
Librarian.

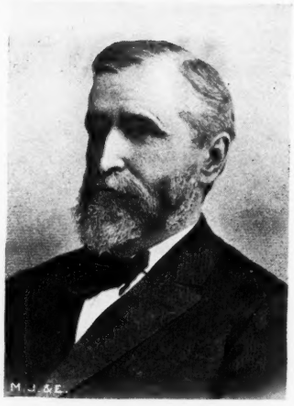
IN Connecticut, a matter of eight miles eastward from New Haven, lies the ancient town of Branford. It may be reached by the old Shore Line railroad, or, more picturesquely, by the trolley-line that fetches a compass to go past many coves or near many rocky headlands on the sound. Or one may follow the old colonial stage-route, with its serene indisposition to turn out for hills, and may enter the town along the one street which through all the early history threaded upon itself about all there was of a village. The town is full of ancientness elbowing closely with modernness, the house with huge stone chimney and shingled sides and projecting second story neighboring snugly with the latest painful endeavor to belong to the architectural pattern of Queen Anne.

The population is similarly mixed, for nowhere are people more keenly aware that they belong to the earliest families, perhaps inheriting a farm or a house in the village through seven or eight generations without a title-deed, and nowhere are they in residence more mixed with the Swede, the Irishman, the Italian, the Pole, the Greek, or the Jew. It is conceded that the shore in Branford is as varied, as picturesque, and as generally enjoyable as any shore in the State; from Short Beach to Stony Creek, it runs back into covers and estuaries and meadows, and again reaches out into bold masses of rock, with off-shore skirtings of islands, in a way that is altogether delightful.

The traveler, coming to the center, finds a most New-England-like "flatiron" green, with three churches, a monument to Branford soldiers, a town-hall, and, opposite the sharp western point of the green, a marble building that seems to have been transported bodily from Greece. The location of this building, on a natural elevation, well smoothed and turfed, was admirably chosen; it has a southern front, and the neighborhood has been gradually cleared till the view of the building from almost any direction is free and fine.

This library-building—for a library it is—originated, like so many other good things in New England, in the tender recollection and sentiment of one who grew up in the town, getting a hard living among the rocks, but, going west, was discerning as to the opportunities there for gathering wealth, and then, in later years, turned back to deal kindly by the town that had been a mother to his five generations of ancestors and that had given birth and training to himself.

Timothy B. Blackstone when a young fellow did a little teaching, picked up the art of surveying, was a rod-man in the making of the New York and New Haven railroad, went west with only a few dollars, climbed to the presidency of the Chicago and Alton railroad, and held that office for thirty-five years. The library that he built and endowed for Branford he meant and marked as a memorial of his father, but inevitably it seems more and more a memorial to the son as well. He lived to see it four years in operation before he passed away.

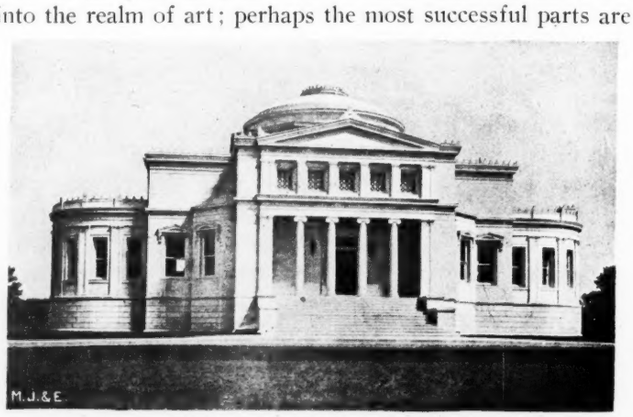


TIMOTHY B. BLACKSTONE,
Donor of Library.

The outside dimensions of the building are 162 by 129 feet. The material, outside and inside, is a warm, pink-veined marble, from East Tennessee. The dome has a backing of marble, eight inches thick, with copper sheathing; it seems low from without, but it stands fifty feet above the rotunda-floor. The building is fireproof throughout.

Mr. Blackstone, living in Chicago, naturally looked there for an architect, and his choice fell upon S. S. Beman. Mr. Beman chose the Ionic type of architecture, and the building is considered one of the most purely and successfully Greek structures in the world. The details were taken from the Erechtheion. The nobleness of the approach, the dignity of the portico, the attic story over the portico, the huge bronze front doors, the massive columns within, the soaring dome, with its beautiful panel-pictures, the polish and the warmth of the marble inner walls, the richness of the ornamentation about the principal doors, the echinus-molding in many places, the antique-oak wainscoting, the mosaic floors, are points that strike even the careless observer.

Mr. Blackstone also found in Chicago Oliver D. Grover, the painter of the pictures in the dome. The series represents the history of bookmaking, from the gathering of the papyrus in the Nile, through the records of the Pharaohs, stories from the Iliad, mediaeval illumination, Venetian copperplate-printing, the first proof of the Guttenberg Bible, and the Franklin press, to a typical bookbindery of the present day. Perhaps the last of the eight is the least successful, as it certainly would seem to be the one most difficult to lift into the realm of art; perhaps the most successful parts are



JAMES BLACKSTONE MEMORIAL LIBRARY, BRANFORD, CONN.—PHOTOGRAPH BY MOONLIGHT AT MIDNIGHT—ONE HOUR'S EXPOSURE.

the white-robed monks, busy with the illumination of manuscripts, and the graceful figure of the lady who is helping Guttenberg to study his proof. Mr. Grover also painted the medallion-portraits of eight American authors, on the marble spandrils between the arches that support the dome. The panel-pictures are superbly framed in the richly ornamented and gilded ribs of the dome. Hence the building is especially beautiful at night, with the full power of the crown of electric lights.

As one passes the inner doors, he finds at his right a large reading-room, with a hundred and twenty periodicals, and two reference-rooms; on the left is the stack-room and the issue-department, with the librarian's office and the catalogue-room. At the rear, with a special entrance from outside, is a hall, seating 400; it is finished in quarter-sawed oak. On the second floor are connected rooms for art-exhibitions, and a suite of rooms for the trustees. Under the whole body of the building is a basement, awaiting the demands of the future.

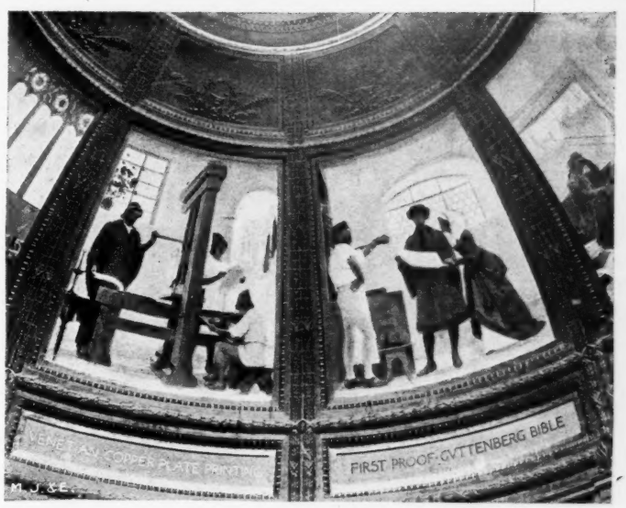
The building was dedicated in June, 1896, and went at once into use. Mr. Blackstone had equipped it with about 6,500 volumes and a printed catalogue. Since then the steady acquisition of books has brought the total up to about 11,500. In February, 1900, a branch was opened in Stony Creek, a delightfully craggy region, where fishing, quarrying, and the summer resident are the principal objects of activity. The branch has a dozen periodicals, a modest stock of permanent books, and a semi-weekly trip to and from the central source of supply. There, as at the center, the work began chiefly with the young; as always with branches, many are reached who would rarely if ever have seen the inside of the main library.

At the outset the wise policy was adopted of having a very low age-limit; the inrush of the children helped the development of the reading-habit in adults; some books in foreign languages have been bought; "the shore-people" have been glad to find the resources of a good library near at hand. In one way and another the issue of books has been built up until it has passed the line of 41,000 a year.

The administration is in the hands of six citizens of Branford, and, *ex officio,* the librarian of Yale. The organization of the work was done by or under Arthur W. Tyler, the well-known library-expert. After he gave up the direction, it went on under Miss Susie A. Hutchinson. Henry M. Whitney has had charge since November, 1899.

It must be confessed that the Blackstone library had a narrow escape from being unpractical from a library point of view; as with some other esthetically noble buildings, the architect did not altogether have in mind the librarian's special needs. But the mistakes were not hopeless, and the process of adaptation can go on by degrees without overwhelming expense. Mr. Blackstone, in what must have been one of his very last letters, sketched his idea of what the adaptation should be to give room for 70,000 volumes. With the basement shelved and connected with the stack-room by stairs and a lift, there will be room for many thousand additional books, besides the ampler space and the freedom that the children so greatly need.

The library-board have purchased 400 carbon-photographs, mostly large, and have hung half of them upon the



SPECIMEN OF PAINTING IN THE DOME—BLACKSTONE MEMORIAL LIBRARY.

walls, but have not yet carried art-work beyond that point. Every winter lectures and concerts are given in the hall.

The endowment provided by Mr. Blackstone during his life and by his will is sufficient to enable the board to do a most beneficent educational work, and yet there is room in Branford for all that they can do. They are free to adopt at least many of the most progressive ideas as to the attack by libraries upon ignorance and vice, the helping of children to acquire a passion for reading and a taste for the best, the enabling of mechanics to be intelligent in the line of their crafts, the impelling of the choicest spirits toward a higher education, and the general leavening of the town with the ferment of studied books. These things are still largely in embryo, but development is certain and has visibly begun. Already the discerning can see how the faith and the affection of the community are turning toward the library as the center and the source of some of their dearest hopes.

DRAINAGE OF TOWNS.

BY H. G. TYRRELL, C. E.

Originally sewers were for the purpose of surface drainage only. It was at that time illegal to discharge house refuse or other foul matter into them. In 1847, in England, this idea seemed to be reversed, and by act of Parliament it became compulsory for all drainage in cities and towns to be discharged into the public sewers.

As the science of sewering now stands, the principal objects are that the pipes be perfectly tight, that they are of the proper size and arranged at a suitable fall, and that means be provided for their flushing and ventilation.

In starting the work of draining a town, whether it is intended to finish the work at once or not, a plan showing the complete system should be drawn so that when it is ended the arrangement will be in accordance with the original design. It is almost needless to say that a system of sewers should be perfectly tight from end to end. If they allow foul liquids and gases to permeate the ground they are no better than the vault or cesspool.

The fall or incline of sewers is also of great importance. Adams gives the following table on calculation and obser-

vation for the size of sewers running either full or half full.

"For 6" pipe a grade of 1 in 60.
"For 9" pipe a grade of 1 in 90.
"For 12" pipe a grade of 1 in 200.
"For 15" pipe a grade of 1 in 250.
"For 18" pipe a grade of 1 in 300.
"For 24" pipe a grade of 1 in 400.
"For 30" pipe a grade of 1 in 500.
"For 36" pipe a grade of 1 in 700.
"For 48" pipe a grade of 1 in 800."

When the direction changes, the friction increases and the fall must be increased to compensate for this. When the lay of the land will permit it, the most rapid fall should be given at the upper end of the sewer, where the quantity of water is least, and consequently where the velocity is needed to secure the flow.

Mr. McKenzie, an experienced engineer from London, England, quotes an instance in which the level of the sewer being out from one-sixteenth to one-eighth of an inch had to be removed. The fall in this case is very small, being only seven inches in a mile. "It had," he said, "been laid down but twenty-four hours, and the cement was then harder than the brick."

If the amount of water flowing is proportional to the size of the conduit, sewers of different size give the same velocity at different inclinations; for instance, a ten-foot with a fall of two feet per mile, a five-foot with a fall of four feet per mile, a two-foot with a fall of ten feet per mile, and a one-foot with a fall of twenty feet per mile, will have the same velocity, but the ten-foot sewer will require one hundred times as much sewage as will the one foot sewer, and unless it carries a volume of water proportional to its capacity the velocity of its stream will be correspondingly lessened. It becomes, therefore, especially important that the size of the conduit be adjusted to the volume of the stream. When half full and when full the velocity is the same and when a little more than three-fourths full the velocity is greatest.

In determining the size of a sewer it is necessary to consider not only its fall, but also the amount of rainfall and sewage which it is required to carry away.

The commonest of all defects in sewers is that expensive one, being too large. It is much better to have occasional repairs, due to excessive rainfalls, than to allow for extraordinary cases. The invariable result of making the sewer too large is that a sediment forms in the bottom and before long they are clogged with filth, only a small orifice large enough for the ordinary flow remaining, whereas, had they been of the proper size they would have by their own flow been kept clean and would have received a much greater rainfall than the larger, but choked sewer.

In small towns and villages it is not usual to allow for greater rainfall than one-quarter inch per hour. In cities where the area is mostly built and the water can more easily find its way to the sewer a fall of one-half inch per hour is allowed. Even in populous towns and cities a considerable quantity of water will not reach the sewer but will soak into the ground or evaporate. Allowing that a fall of one-half inch per hour reaches the sewer, this is providing for a much heavier fall, probably about one inch. Baldwin Latham, after lengthy observation, decided that the average amount of sewage in a town with water supply was about twenty gallons for each person per diem. Half of this will be discharged between 9 a. m. and 5 p. m.

As a stream flows on, its velocity will increase and consequently its volume will diminish. So that a pipe running full at its upper end, may receive a large quantity more during its course. In upper George street, London, a brick sewer five and one-half feet high and three and one-half feet wide has a twelve-inch pipe laid along the bottom for a distance of 560 feet. This was never known to be at all choked. During storms stones can be heard rolling along the bottom. This pipe is rarely more than half full at the head. The cross sectional area of all the house drains entering it is equal to that of a pipe thirty feet in diameter. Although the twelve-inch pipe is always clean, twenty or thirty feet from its mouth in the large brick sewer, deposits of filth are constantly gathering which have to be removed by the expensive method of hand labor. Instances have frequently occurred where workmen have put in as sewers, by mistake, pipes which the architect intended for a single house, and the result has been that they were always clean and served the purpose well.

The round sewer is, as a general rule, the best. With it we can always secure a good joint by turning the best fitting parts to the bottom. Besides they have the greatest area for the amount of wall. The pipe should always be hard and smooth. If at all porous they contaminate the adjacent ground, and render the pipe more subject to frost and to the destroying action of sewer gases. If there is any danger from roots of trees, etc., it will be advisable to lay the pipe in cement. Where the supply of sewage is very intermittent an egg shaped sewer is sometimes preferred. Where the stream becomes very shallow it is also narrow so that sediment is not so likely to collect. This latter kind is usually made of brick and is more expensive.

One author describes the danger of unventilated sewers as being greater than that of a steam engine without a safety valve, and indeed it is so, for while in the latter case the lives of but few are exposed, in the former the health and life of the whole community is at stake. As temperature changes, tides rise or fall, the force of wind at the mouth of sewers varies, the pressure of the confined gases is changed, and as the amount of water in an ordinary trap is but small the probabilities are that they will be forced or syphoned. If syphoned, a district communication between the public sewer and our houses will be established for the entrance of poisonous gases. Besides, if means be provided for a free passage of air through the sewer, the same amount of gas will not be generated for much of the foul matter in a short time becomes oxidized.

Ventilation by means of water pipes to the eaves of houses has been advocated, but this method is faulty in that when most needed, during heavy rains, the pipes are choked with a flow of water. Most sanitary authorities have decided that the best sewer ventilation yet used are man holes covered with iron gratings and emerging in the center of the street. The charcoal ventilator has been used with great success. In the sewerage of Croydon, England, 560 are employed at a total yearly expense of less than one dollar

and a quarter for each. It consists of a special tray covered with charcoal, set in the ventilator so that all gases ascending are forced to pass either through or over the charcoal. When we remember that one cubic inch of this substance contains as much interior surface as 100 square feet, we can form some idea of its power as a disinfectant. Around the special tray is a box for catching any rainfall or dust which may find its way through the iron grating. These ventilators in order to give thorough satisfaction should be placed every two or three hundred yards in the sewer. They should not break off immediately from the sewer, but should rise from a chamber of about a foot, so that passing gases will be more liable to be caught. When the street incline is great a light hanging valve may be placed above each ventilator. This will not obstruct the flow of sewage, while it will prevent gases rising to the higher parts of the system of sewers, and all escaping from one place or through a few ventilators.

In the city of Windsor, England, in 1856 a case of typhoid fever was discovered. From lack of proper ventilation of sewers the foul and poisonous gases from the faecal matter of this one house, rising through forced and syphoned traps caused the death of no less than 450 persons, and all of whose houses without exception were connected with this sewer. Windsor Castle, having its own drain, escaped the disease.

In Cassel, also, the breaking out of typhoid fever in the higher parts of the town while the lower lying portions remained untouched was considered a mystery till it was found that the sewers not being properly arranged, allowed the poisonous gases to rise to the higher parts of the system where they escaped, spreading the germs of disease. In this, as in many other cases, the community had to be stirred into action by the cruel hand of death.

When a system of sewers is faulty in grade or size, special appliances for flushing should be provided. One good arrangement consists of an iron tank fastened on trunions, having the back end heavier when empty. On being filled with water and waste the front end becomes the heavier and it is canted forward. It is faulty in one respect; that when in fallen position all matter issuing from the sewer above it will form a pile of filth beneath the back of the box. Other arrangements, such as dams, etc., have been used, but they are insufficient, since they are not self-acting, but require constant attention. Another useful flushing tank for sewers has a disc held in place by the force of the water covering the mouth of the sewer running from the manhole. The sewage is periodically released by means of a chain fastened to a circular block, but as a precaution a float is attached to the chain so that should the other rise to that height it will liberate itself.

If, however, the sewer be properly arranged in other respects it will require but little flushing. During hot summer months, or if fever be prevalent in the town, an occasional cleansing will be necessary. The work should always be begun at its lower end, so that there will be no danger of deposits already at the lower end stopping dirt coming down the sewer.

For the purpose of receiving water or arresting silt and solid wash from the streets, catch basins may be placed at the corners of the streets or wherever required. In these the iron for the mouth of the pipe leading to the sewer is hinged at the top and is cemented to the brick work with plaster paris so that in case of frost the cement only will break, which can, in the spring, be repaired. Many engineers still prefer the method of conveying street wash away in a separate gully. These conduits may be constructed in the form of deep cast iron gutters covered with a cast iron grating, the inner edge of the gutter being carried up to the height of the sidewalk.

As the accumulated flow requires, an increase is to be made in the depth rather than the width. This would insure the keeping clean of the gutter.

The chief objection to this method is that in the winter time the crossings become coated with ice, but this difficulty seems to be no greater than that arising from ice on the sidewalks and about the catch basins.

Sewer systems, built on scientific principles, are expensive in the first cost, but they pay for themselves in the long run, when the saving of human life is taken into account. Every town of any considerable size should have its sewer system under way, and no city should be without one.

TESTS FOR HYDRAULIC CEMENTS.

THE extensive use of hydraulic cements in municipal work, and especially in the laying of pavements, requires that thorough tests be made of the different brands of cements submitted by the contractors.

Mr. Nelson P. Lewis, Chief Engineer of Highways of the Borough of Brooklyn, New York, in an interview, had this to say of the methods employed in his department in applying such tests:

"Samples of the material to be used are sent to our laboratory and there undergo such tests as are deemed sufficient to expose the good and bad qualities. When received, the samples are first passed through a 20-mesh sieve to remove all foreign matter in the nature of sticks and straws. A small portion is then placed on a piece of paper, or preferably on thin oil-cloth, and for three or four minutes thoroughly mixed by alternately raising the corners of the cloth, causing the cement to roll over on itself.

"A chemical test is made to determine its composition and the relative amounts of Lime, Alumina, Silica, Sesqui-oxide of Iron, Magnesia and Sulphuric Acid or its equivalent of Sulphate of Lime.

"The first physical test is that for 'fineness.' The finer the cement (if otherwise good) the more sand it will take, and, consequently, the greater its value. Three batches of 100 grammes each are weighed out, and for three or four minutes one batch is shaken through a 50-mesh sieve, one through a 100-mesh, and the third through a 200-mesh. The weight of cement that has passed through each sieve is ascertained and this, compared with the former weight, shows the percentage of fineness for each sieve.

"The time required for the cement to set is next obtained. A small quantity of neat (*i. e.*, pure) cement is mixed to a stiff paste with water and moulded into a pat. The time is noted until the pat will bear, without indentation, a wire one-twelfth inch in diameter, weighted with one-quarter pound. This condition is known as the 'initial' set. A further time is taken until the cement sets 'hard,' *i. e.*, when a wire one twenty-fourth inch in diameter with a weight of one pound will not indent the pat.

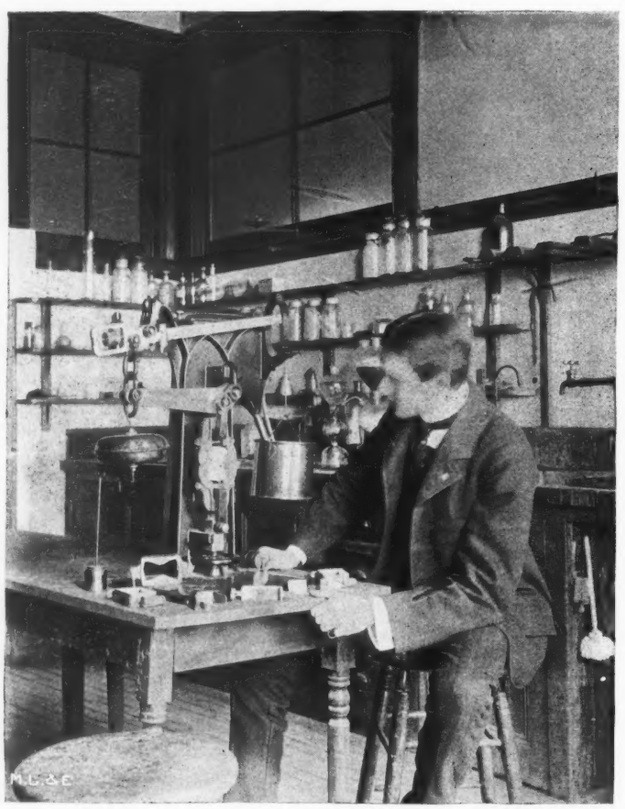
"Practically the only test that can be applied to ascertain the adhesive power of cement is that known as the test for tensile strength, after the material is subjected to various conditions of heat and moisture. For this work it is necessary to have a special machine, those of Fairbanks or Riehle being the ones usually employed.

"Small quantities of cement are carefully weighed out, each to be

submitted to different conditions before being placed in the machine. The batches are mixed with water until a stiff, plastic paste is formed. The mixing, while thorough, must be done quickly to prevent the paste from setting. To obtain the right constituency, Rosendale cement requires about 25 per cent. of water, Portland but 20 per cent. or less. The paste is in the proper condition if, when rolled into a ball one inch in diameter and dropped onto a glass plate from a height of four feet, it still retains its general shape.

"When properly mixed, the paste is pressed, bit by bit, into forms of bricquettes, each having an area of one square inch at the smallest cross section or 'neck.' Care is taken to exclude all air holes so as to secure a uniformity of structure, and the weight of each is carefully determined.

"Four bricquettes are placed in water after setting hard and are kept therein for twenty-four hours before being tested in the machine. Four are kept in moist air for twenty-four hours and then, for six days, in fresh water at a temperature of 60 to 70 degrees F.



A CORNER IN BROOKLYN'S ENGINEERING LABORATORY.

The remaining bricquettes are subjected to moist air for one day and then kept for twenty-seven days before testing.

"Another dozen bricquettes are made from a mixture of two parts by weight of sand and one part neat cement if a natural or Rosendale cement is being tested, and of three to one if Portland. The sand employed is usually the Standard Quartz Sand, composed of pure quartz crushed to a uniform fineness. In case of a test for any special purpose, the sand to be used on the work is employed, as the test becomes of more practical value thereby, but with the aim of contrasting cements the Standard Sand is necessary. The sand and cement are mixed dry and all the water added at once.

"Sets of four of these sand-cement bricquettes are subjected to the same conditions as those of cement only. When ready, a bricquette is placed between the clips of the machine, as shown in the illustration, and the stress applied at a uniform rate of about 400 pounds per minute. Very fine shot is allowed to run from a reservoir in the upper part of the machine into the pail shown on the right of the picture. The weight of the pail and the shot is so multiplied by levers that a stress of about 1,000 pounds per square inch can be secured. The flow of shot continues until the bricquette breaks at the neck between the clips, when the shot is automatically stopped. The pail and shot are carefully weighed by hanging them on the opposite side of the machine, and the amount of pull, necessary to fracture the bricquette, is read off on the scale beam. As the arm supporting the pail has considerable motion, and that of the clips very little, the leverage is greatly multiplied.

"The Portland cement used in constructing curbs in Brooklyn must develop or exceed the following tensible strength per square inch. The time of experiment varies slightly from that already given.

"Neat cement after remaining 1 hour in the air and 23 in water, 225 pounds.

"Neat cement, one day in air, 6 days in water, 500 pounds.

"Neat cement, 1 part by weight Standard Sand, 3 parts, one day in air, 6 days in water, 225 pounds.

"There is another important physical test necessary to be applied to cement, and that is the test for 'soundness.' It includes observations as to the cracks, distortions, color, etc., of the material when subjected to different conditions of temperature and moisture. Four quantities of neat cement are worked up into a stiff plastic paste with the proper percentage of water. These are moulded into pats, three inches in diameter, and about one-eighth of an inch thick at the centre, thinning out towards the edges. One pat is placed in moist air as soon as formed. Another is kept in a steam bath for three hours and then in boiling water for twenty-four hours. A third is allowed to set hard in moist air, when it is transferred to a steam bath for three hours, followed by boiling water for twenty-four hours. A fourth is placed in moist air until hard set, and then in water until tested.

"While passing through these conditions, the pats are critically examined. Any cracks, checks or distortions in the cement would cause its rejection as unfitted for use. The color must be alike throughout all the pats to prove uniformity of material. Should the pats work up hot, the presence of unslacked lime is indicated, and mortar, made of such cement, would crack after being laid."

PASADENA'S SEWER FARM.

THE city of Passadena, California, so far as known, runs the only municipal sewer farm in the United States. A recent inventory of the property shows an investment of $76,000 in 300 acres of land, $175 in seven horses, $75 in harnesses, $250 in hogs and hay, and $530 in machinery and tools, making a total of $77,030.

The California Municipalities, in a recent issue, reports:

"Cash received for sale of Alfalfa hay, $662.52; barley hay, $8.82; hogs, $360.57; walnuts, $3,500.01; wood, $2.25; burial of dead animals, $6; collection on old accounts, $10.94; total, $4,551.11.

"Running expenses of farm, for labor, superintendents and assistants, $2,109.64; board of help, $496; feed, veterinary and horseshoeing, $370.81; seeds and seed grain, $183.95; repairs, $169.51; walnut bags, $73.36; material for bleaching walnuts, $38.85; lumber and hardware, $37.83; sundries, $50.75. Total, $3,430.70.

"There has also been expended for permanent improvements and new machinery $463.25, as follows: For 860 walnut trees, $154.80; wagon scales, $131; mowing macking, $69; cultivator, $53; rake, $35; other implements, $20.45.

SUMMARY OF YEAR'S BUSINESS.

"Total receipts from sale of produce, etc.	$4,550 17
Hay to Fire Department	300 00
Hay to Street Department	300 00
Total	$5,140 17
Total disbursements account sewer farm, $3,893.95, less amount expended for permanent improvements $463.25	$3,430 70
Gain for year ending February 1	1,709 47
Total	$5,140 17"

GARBAGE DISPOSAL IN CLEVELAND.

To obtain a comprehensive understanding of the system of garbage disposal in Cleveland, it is necessary to have in mind a few peculiarities of the city itself. First of all, Cleveland covers a large area, about 32 square miles, of which a good proportion is thinly populated. The irregularity of the streets adds to the difficulty. In many cities, alleys run between the streets at the rear of the houses so that a garbage wagon can drive through the alley and collect the refuse from two streets at once. This arrangement of streets is rare in Cleveland, and as most of the business houses are surrounded by large lawns the collector has a great amount of extra work in getting the garbage to the wagon. There are also large numbers of foreigners and in these districts the "garbage habit" is new and has to be cultivated.

An ordinance passed by the council, July 18, 1898, provided for the collection, removal and destruction of garbage and for the keeping of garbage cans. In the contract subsequently made, the word garbage was meant to include offal, dead animals and other matter, both vegetable and animal, which would, or was liable to ferment or decay or in any way become offensive or a menace to the public health, but it did not include street sweepings, night soil or ashes.

Daily collections are made within a three mile limit from hotels, hospitals, commission houses and similar places. In the same district three collections are made a week from all other places where garbage may accumulate, from May to October inclusive, and during the rest of the year two collections are made each week. Outside the three mile limit two collections are made a week. The entire work is under the supervision of the Director of Police.

The work is performed by the Newburg Reduction Company, which began work August 22, 1898, at a time when the difficulties of operating this department were greatest. The annual cost to the city is $69,400 or about $2.83 per ton. This makes the cost per capita about $0.18 per year.

During the first five months the garbage removed and destroyed was 5,508 tons, or 1,000 tons per month; for 1899, 22,375 tons or almost 2,000 tons per month, and for the year 1900, 29,159 tons or almost 2,500 tons per month. The increase is largely due to the foreign element becoming accustomed to saving the garbage for the city to take care of. The company also disposes of about sixty-five dead horses per month.

There is no one system of garbage disposal which the Newburgh Reduction Company has adopted in total, but its present plant is a composite of different systems which has been perfected by its own experiments under the careful attention of Mr. Ernest Peck, the superintendent.

The work is divided into two departments; the collection and the reduction. The collection requires some sixty-five four wheeled wagons to cover the city. These wagons are made with a water-tight sheet-iron box eight feet by three feet by two feet two inches, with covers so hinged that only one-fourth is opened at a time. When one of the boxes, which holds about one and one-half tons, is filled, it is taken to the garbage station, lifted off and placed crosswise on a car arranged to hold three tiers of eight. The two lower boxes are left off and braces put in their places, thus making the car hold twenty-two boxes. As the box is taken from the gear another box is put on and the driver is ready for another load.

The works are two miles beyond the city limits and the garbage reaches there the next morning. The boxes are unloaded by an electrical crane which runs on a curved track and each box is provided with trunions placed a little below the center so that it can be easily dumped, after which they are cleansed and returned to the collection station.

The reduction plant proper is fitted with five 80 H. P. boilers, one 22 K. W. dynamo and one 100 K. W. dynamo, one pump with a capacity of 1,000,000 gallons per day, ten 5-ton digesters (four more are about to be added), four presses and one dryer. The capacity of the plant with the new digesters will be 200 tons per day.

The garbage is sorted and placed in the digesters, which are of the Detroit Liquid Separating Company's pattern. They are made of five-eighth material, fastened with countersunk rivets hammered out flush with the inside of the tank so as to give as little opportunity as possible for the acid generated to get at them. They are also fitted with false sides and bottoms and a center piece specially designed by Mr. Peck for distributing the steam thoroughly through the garbage. The garbage is then cooked at 80 pounds pressure and 400 degrees for eight hours, steam being constantly fed in through the bottom and carried off from the top through a series of pipes fitted with deodorizers of the jet condenser type, made by V. D. Anderson & Co., of Cleveland, and, finally, after going through a series of settling tanks is discharged practically clear into a creek.

The garbage comes out dry and is carried by conveyors to the four presses made by the Boomer & Boschert Press Co., of Syracuse, N. Y. These presses are guaranteed to stand 300 tons pressure. It is then fed through a continuous dryer, also made by V. D. Anderson & Co., which has a capacity of 1,200 pounds of dry garbage per hour. The heat in the dryer is generated by coils in a square chamber and introduced into the dryer by a blast of air over the coils.

The manner in which the garbage is handled is satisfactory to the Health Department and to the citizens in general.

GROWTH OF GERMAN CITIES.

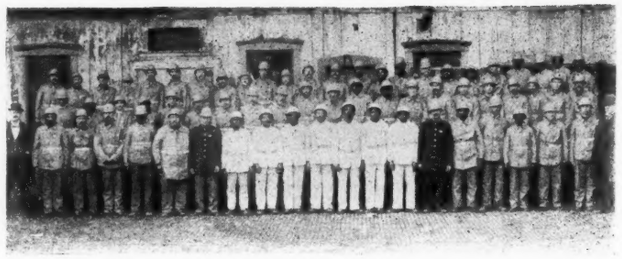
GERMANY'S census, just taken, shows thirty-three cities of over 100,000 inhabitants. Berlin has 1,884,346, an increase over 1895 of 207,041. The others are in order as follows: Hamburg, 704,669; Munich, 498,503; Leipsic, 455,120; Breslau, 422,415; Dresden, 395,349; Cologne, 370,685; Frankfort-on-the-Main, 287,813; Nuremberg, 260,743; Hanover, 234,986; Magdeburg, 229,732; Dusseldorf, 212,949; Stettin, 209,988; Chemnitz, 206,584; Charlottenburg, 189,300; Konigsberg, 187,186; Stuttgart, 176,318; Altona, 160,885; Bremen, 160,823; Halle, 156,631; Elberfeld, 156,503; Strassburg, 150,268; Dortmund, 142,418; Barmen, 141,535; Mannheim, 140,384; Dantzic, 138,108; Aix-la-Chapelle, 135,287; Brunswick, 126,052; Essen, 118,817; Posen, 116,151; Kiel, 107,071; Crefeld, 106,887; Cassel, 105,055. All show an increase except Crefeld, which remains nearly stationary. The greatest percentage of increase is in Nuremberg, Posen, Stettin, Charlottenburg, and Mannheim.

PER CAPITA STATISTICS IN LEADING CITIES.

Cities.	Net debt.	Assessed valuation of real and personal property.	EXPENDITURE FOR MAINTENANCE. Police department, including police courts, jails, workhouses, reformatories, etc.	Fire department.	Schools.	Street lighting.	Other street expenditures.	All other purposes.
New York	$73.21	$1,011.97	$3.61	$1.33	$3.73	$0.38	$2.10	$12.77
Chicago	17.17	203.23	2.30	.97	4.14	.31	.51	2.39
Philadelphia	31.86	680.94	2.68	.76	2.64	.88	1.03	6.88
St. Louis	33.21	649.05	2.54	1.26	2.56	.73	1.52	7.23
Boston	105.72	1,942.86	5.16	2.12	4.94	1.21	2.59	19.21
Baltimore	64.70	762.82	2.12	.96	2.64	.78	.98	6.51
Cleveland	32.04	380.00	1.21	1.16	2.81	.60	.38	7.74
Buffalo	40.27	697.51	2.47	1.71	3.12	.97	.84	6.58
San Francisco	13.02	1,027.90	2.85	2.51	3.33	.83	.91	11.50
Cincinnati	83.65	616.20	2.13	1.35	2.77	1.05	.89	10.63
Pittsburg	36.98	986.19	1.45	1.39	2.88	.86	1.38	7.44
New Orleans	50.70	491.11	1.02	1.05	1.39	2.77	.90	7.64
Detroit	16.13	759.43	2.09	1.75	2.63	...	2.16	5.80
Milwaukee	22.25	532.65	1.19	1.39	2.35	.69	.90	5.85
Washington	54.44	705.33	2.93	.83	3.83	.75	1.39	12.41
Newark	50.53	591.94	1.63	1.12	3.28	.84	.46	11.52
Jersey City	81.14	445.77	1.86	1.03	2.21	.62	1.11	16.14
Louisville	43.98	584.65	1.98	1.16	2.59	.65	.75	5.51
Minneapolis	32.95	526.49	1.18	1.56	3.33	.80	1.36	5.05
Providence	81.68	1,073.49	2.05	1.99	3.77	1.72	1.47	11.66
Indianapolis	18.29	728.85	.91	1.04	4.77	.67	.68	3.52
Kansas City	28.00	433.96	1.23	1.30	2.71	.46	...	6.06
St. Paul	45.88	573.82	1.28	1.22	2.62	.73	1.10	6.45
Rochester	61.58	679.85	1.14	1.48	3.64	1.44	1.85	7.68
Denver	19.66	464.69	.97	1.03	4.87	.54	.83	4.30
Toledo	43.56	392.81	1.05	1.01	2.54	.59	.71	6.22
Allegheny	43.28	645.22	1.05	.98	2.66	.63	.93	7.57
Columbus	48.26	512.46	1.24	1.57	3.18	.60	.56	5.91
Worcester	45.16	948.62	1.34	1.32	4.64	.93	2.32	12.32
Syracuse	68.09	745.19	.78	1.31	3.53	.80	1.10	8.58
New Haven	31.12	622.28	1.85	1.20	3.43	.72	1.04	3.35
Paterson	32.67	452.36	1.10	1.35	2.58	.79	.68	7.81
Fall River	35.17	682.81	1.25	1.10	3.00	.87	1.08	7.86
St. Joseph	14.12	212.81	.59	.49	1.20	...	.36	2.23
Omaha	55.26	340.38	.81	1.15	4.50	.78	.76	5.87
Los Angeles	15.54	640.86	1.19	.93	2.23	.49	1.57	4.59
Memphis	29.54	369.32	.83	.71	.97	.37	.40	3.30
Scranton	8.37	212.89	.55	.48	2.78	.44	.51	1.69
Lowell	34.84	750.30	1.30	1.25	2.87	.88	1.86	9.79
Albany	35.45	909.94	1.73	1.58	3.01	.92	.90	6.91
Cambridge	65.58	966.26	1.27	.93	4.49	.78	1.66	11.02
Portland	61.81	427.81	.76	.95	2.76	.55	.45	5.17
Atlanta	31.25	581.27	1.58	1.17	1.63	.83	.86	9.64

STREET CLEANING IN PITTSBURG.

Surrounded as it is by vast manufacturing industries, iron works, foundries and the like, where soft coal is almost universally used, Pittsburg is one of the most difficult cities in the United States to keep clean. The Department of Highways and Sewers, of which Mr. John Battles is superintendent, is accomplishing the almost impossible task, and the streets of Pittsburg, all things considered, will compare favorably with those of most of the larger cities in the Union, in regard to cleanliness.

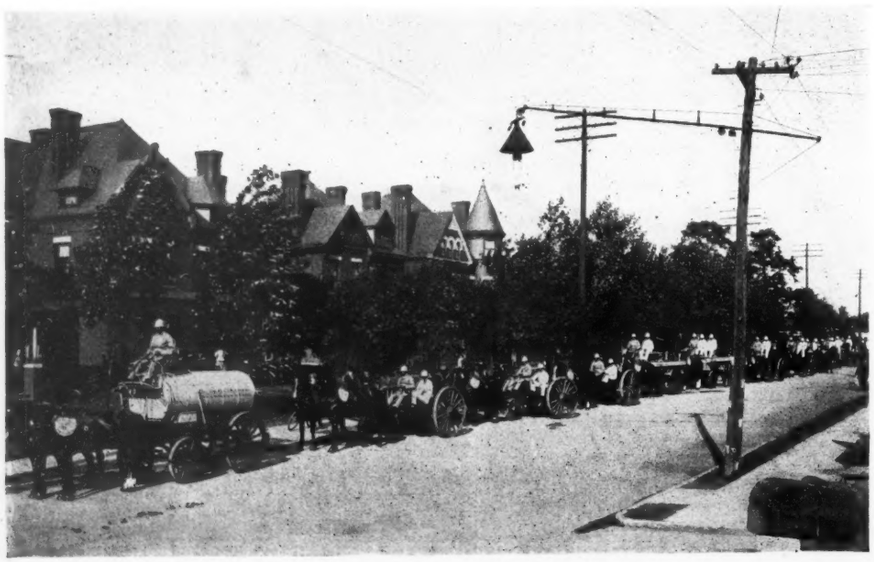


THE "WHITE WINGS" OF PITTSBURG.

Pittsburg's street cleaning plant is owned by the city, and consists of sixteen street sprinkling wagons, twenty street sweeping machines, and 150 patrol carts, besides eighty wagons which gather up the sweepings, and ten gondola railroad cars in which the refuse is shipped to the city's dumps. Most of the machine street sweepers are of the Ostler type, and one of the Studebaker. The Studebaker Co., of South Bend, Ind., made the sprinkling carts.

Every street which is paved in the "down town" section of the city is swept daily, and the principal thoroughfares are continuously cleaned by hand sweepers, who are uniformed in white similar to New York city's famous "White Wings." These laborers receive $1.50 a day, and inspectors see that they perform their work thoroughly during the required hours. In the resident sections and otherwise throughout the city, the paved streets are swept twice a week. The down town streets and the principal driveways are sprinkled daily during the warm months. The street cleaning service, including salaries to sweepers, foremen, drivers of carts, inspectors, and the like, takes $125,251. There are in the street cleaning work employed 404 men. The total expenses of conducting the department, including cost of sewer repairing and cleaning, street sweeping, etc., is $202,452.

All repairs to asphalt streets are done by contract and paid for out of the appropriation to this department. It is only repair work on block streets that is done by regular city employees.



STREET SPRINKLERS AND SWEEPERS OF PITTSBURG.

The garbage is collected by a private concern, and is reduced at its own plant. House owners must arrange for the carrying away of ashes with private collectors.

The street sweepings are carried out to Brilliant Station, a distance of about seven miles, where the city owns a strip of property. It is a deep ravine, and the sweepings are used for filling it. No attempt is made to sell the sweepings, and the other than its annual appropriation department has no outside revenue from the city.

The city has strict ordinances against the careless throwing of waste paper, sweepings, rubbish, etc., in the streets, and it is against the law to pile material on the side-

walks. There is not an effective enforcement of these ordinances, however, which is to be regretted. As a number of unimproved streets join some of those that are paved, it is difficult to keep altogether clear of dirt and mud in these particular localities. The work in general, however, is surprisingly well done.

The horses belonging to the department number 150, and are an exceptionally fine looking lot of animals. They cost on an average of $200 apiece, and are stabled and cared for in the barns belonging to the department.

In winter, the snow removal, etc., is done by this department without the employment of additional men, and is accomplished in a most satisfactory manner. House and store owners are compelled to sweep the sidewalk in front of their respective places twice a week.

WOOD PAVING IN LONDON.

BY RICHARD WESTACOTT, ACTING CONSUL-GENERAL.

THE duty of paving and maintaining the streets of London devolves upon the local authorities, and not upon the London County Council. By the local authorities is meant the various boroughs into which London is divided.

The cost of the construction of soft-wood (yellow deal) creosoted paving, laid on a bed of Portland cement concrete (6 to 1 or 8 to 1) 6 inches in depth, ranges in London from 10s. to 12s. ($2.43 to $2.92) per superficial yard, and of hard-wood (Australian) paving, from 12s. to 16s. ($2.92 to $3.89) per square yard. The annual cost of maintenance in the case of soft-wood blocks is from 1½d. to 2d. (3 to 4 cents) per superficial yard; but reliable information is not obtainable with regard to the wear and tear of hard-wood blocks.

In the borough of St. Marylebone, London, a large area of Swedish deal block paving has been laid in the principal carriage ways. Very little of this has been treated with creosote or other similar compound, the greater part being simply grouted with a composition of pitch tar, etc., the oils of which permeate the wood. This material lasts from seven to eight years in streets of heavy traffic and from twelve to thirteen years in streets of lighter traffic. The blocks are from 5 to 6 inches in depth, and are usually laid upon a foundation of Portland cement concrete.

It is found that untreated wood blocks put down in carriage ways where they are not subjected to any traffic worth mentioning are very liable to decay, and it is considered by many that it is advisable to treat all soft paving with creosote, carbolineum, or other compound, as this treatment conduces to the life and soundness of the material and renders it more sanitary and healthful.

The following is a standard specification for laying wood paving:

The carriage way shall be laid with wood paving. The entire area under the wood paving, and the adjacent curbs, shall be formed of Portland-cement concrete, of the depth shown on the drawings, and shall be properly floated on the top with fine stuff. The whole of the concrete to be composed of Portland cement and ballast in the proportions otherwise as described in clauses 16, 18, and 19; the fine stuff for the floating to be composed of one of cement to five of sand, and the surface to be properly ruled and finished off and left hard and smooth. When the concrete foundation has been properly formed and has thoroughly set, the space between the curbs is to be paved with wood, as hereafter described. The paving is to be of new wood blocks, 6 inches deep by 9 inches by 3 inches, cut out of the best approved Swedish yellow deals (Gothenburg thirds), thoroughly sound and square, properly and uniformly cut, entirely free from sap, shakes, large or dead knots, and all other defects, and creosoted so as to be increased in weight not less than 12 pounds per cubic foot. As soon as the concrete foundation is thoroughly set to the satisfaction of the engineer, the blocks are to be laid upon its surface in rows at right angles to or radiated across the street, a space of three-eighths of an inch being left for the joint. At each side of the carriage way two courses are to be laid longitudinally (a suitable margin, 2 inches wide, filled in with approved clay, being left next the curbstone to allow for swelling). The blocks at all intersections of streets are to be laid with proper angle courses. Each block is to have three approved cast-iron studs fixed thereto, according to sample at the office of the council, or some other approved means shall be adopted for keeping a uniform joint. The joints are to be carefully and fully filled up with grout, composed of one part of Portland cement and five parts of clean, sharp Thames or approved pit sand, mixed with water in a grout truck, and swept into the joints. Upon the surface a top dressing, 1 inch in thickness, of fine ballast is to be spread, after which the traffic is to be fenced off for six days. Where the wood paving abuts against any macadam road, a double course of approved granite sets (grouted) is to be laid on concrete along the whole length of the joint, between the wood paving and the macadam. The concrete under the wood paving shall be continued on to form the bed for the pitching, and shall project at least 3 inches beyond the pitching.

If the engineer shall so order, the wood paving, instead of being laid with open joints as above described, shall be laid with close joints, run in with pitch and tar to the engineer's approval and as he may direct; in all other respects the provisions of cause 23 will apply.

Instead of the deal blocks mentioned in clause 23, the wood blocks shall be the best quality karri or jarrah timber, laid with close joints and run in with pitch and tar. These blocks are to be 9 inches by 3 inches by 5 inches deep, and will not require creosoting, but shall be dipped once in boiling tar at the time they are laid; in all other respects, the provisions under clause 23 will apply.

IMPORTANT CONFERENCE OF REFORMERS.

THE seventh annual meeting of the National Municipal League and the ninth conference for good city government, which will be held in Rochester, N. Y., on May 8, 9 and 10, will be of more portentious and widespread interest than any of those that have preceded it.

Aside from the array of speakers—men of national and international prominence—the subjects that will come before the meeting for discussion and consideration are of an importance that must command attention from all thinking persons, but especially students of the municipal problem of "Better City Government."

Already the National Municipal League has demonstrated its ability to cope with such questions in the preparation and adoption of the "Model City Charter." Though not accepted in its entirety, its basic principles have been taken by several municipalities which have amended their charters or adopted a new form of government.

The theme of the meeting this year will be "Uniform

Municipal Accounting." The subject has received the attention of the League for some time past and will be presented to the conference in a report by Dr. Edward N. Hartwell of the Boston Statistical Bureau. Under the head of "Public Control of Municipal Accounting and Statistics," there will be a general discussion of the conditions as they exist in this country, Great Britain and Continental Europe. The speakers will be Dr. E. W. Bemis and Dr. John A. Fairlie. A paper on "The Present Condition of Municipal Statistics" will be read by Dr. Henry C. Adams, Statistician of the Interstate Commerce Commission, and Charles W. Haskins will treat of "The Municipal Accounts of Chicago."

The morning session of Saturday will be devoted to a conference of the Committee on Municipal Accounting. The agitation is in the interest of a uniform system of accounting in all municipalities, whereby a comparison is made possible of the expenditures for the public monies and the cost of maintenance under the different conditions of government.

The first session of the conference will be held Wednesday afternoon. Clinton Rogers Woodruff, secretary of the League, will present his report showing "A Year's Municipal Activities," and George Burnham, Jr., the treasurer, will read his report for the past year. Several papers will be presented, among which are "The Work of the American Society of Municipal Improvements," to be read by E. A. Fisher, city engineer of Rochester; "The Work of the League of American Municipalities," by Hon. James N. Head, Mayor of Nashville and trustee of the League, and "The Relation of Baden Cities to the State," which will be presented by Dr. jur. Max Horstmann, of Heidelberg, Germany.

The annual election of officers will take place on Thursday morning, after which will be submitted the report of the committee on "Instruction in Municipal Government in American Educational Institutions." The report will be presented by President Thomas M. Drown, of Lehigh University, who was Chairman of the committee, and it will be followed by special discussion of the subject by Professor John H. Finley, of Princeton University, and Dr. James T. Young of the University of Pennsylvania. The discussion will not be restricted to these gentlemen, but will be general, as the subject is one of particular importance to the League.

The afternoon session will be given over to a discussion of "Primary Election Reform" and "Recent Charter Legislation." The papers on "Election Reform" will be by Charles B. Spahr, Associate Editor of *The Outlook;* on "Primary Election Laws and Their Operation," and Ernest A. Hempstead, Editor *The Crawford Journal,* Meadville, Pa., on "The Crawford County System." The discussion of Charter Legislation will be by James W. Pryor, Secretary of the City Club, who will speak of the conditions in Greater New York; Louis D. Brandeis for New England; Charles E. Monroe, Secretary of the Municipal Association, of Milwaukee, for Wisconsin; J. S. McLain for Minnesota, and Hon. James D. Phelan, Mayor of San Francisco, for California.

On Friday morning George Burnham, Jr., of Philadelphia, Chairman, will submit the report of the committee to "Invite the Co-Operation of Business Bodies," and reports will be received from all the cities to which the invitation has been extended. R. Fulton Cutting, of New York, President of the Citizens' Union, will read a paper on "New York Anti-Tammany Union"; William Ritchie on the "Chicago Street Railway Situation," and the following gentlemen will also participate in the proceedings: Charles Nagle, "St. Louis"; Colonel H. M. Boies, of the Scranton Municipal League, "Scranton"; John F. Moors, "Boston"; Charles J. Bonaparte, Baltimore Reform League, "Baltimore"; Clarence S. Palmer, President of the Kansas City Bar Association, "Kansas City"; Hon. W. W. Howe, "New Orleans"; J. Richard Freud, Secretary of the Merchants' Association, "San Francisco," and Howard Hamilton, Secretary of the Citizens' Association, of Biddeford, Maine, "Maine Cities."

Friday night the visiting delegates will be the guests of the local association of the National Municipal League at a banquet.

MEETING OF THE OHIO LEAGUE.

J. R. LINDEMUTH, Mayor of Dayton, President of the Ohio League.

THE next meeting of the League of Ohio Municipalities, which will be the fourth one since its organization, will be held at Cleveland, on May 14th to 16th inclusive. The officials of the Buckeye State are looking forward with eager anticipation to this meeting, as it will give them an opportunity to see, hear and become better acquainted with the most noted Mayor of the Middle West, Hon. Tom L. Johnson. The programme, as will be seen below, contains interesting topics for discussion. It is expected that Cleveland will put on her best "bib and tucker" to receive her guests, and that she will endeavor to make them happy and contented while they remain within her gates.

PROGRAMME.

FIRST SESSION—Tuesday, May 14—2:00 P. M.

Address of Welcome—Hon. Tom. L. Johnson, Mayor of Cleveland, Ohio.

Response—Hon. Jesse R. Lindemuth, Mayor, Dayton, Ohio.

Reports of Secretary and Treasurer.

Address—The Predatory Corporation—Mr. William S. Crandall, Editor MUNICIPAL JOURNAL AND ENGINEER, New York City.

Address—Electrolysis of Water and Gas Pipes, Resulting from Electrical Currents Escaping from Street Railways—E. P. Matthews, Esq., City Solicitor, Dayton, Ohio.

SECOND SESSION—Tuesday, May 14—7:30 P. M.

Address—Hon. Samuel L. Black, Ex-Mayor, Columbus, Ohio.

Address—Municipal Electric Lighting—Mr. Edward B. Ellicott, City Electrician, Chicago, Ill.

THIRD SESSION—Wednesday, May 15—9:00 A. M.

Address—Quasi Public Franchises—Hon. Samuel M. Jones, Mayor, Toledo, O.

Address—Taxation of Public Service Corporations—Frederick C. Howe, Esq., Councilman, Cleveland, Ohio.

FOURTH SESSION—Wednesday, May 15—2:00 P. M.

Address—Non-partisan Civil Service for Cities—Hon. Samuel J. Swartz, Ex-Mayor, Columbus, Ohio.

Address—Municipal Debt—Hon. Paul Huxley, Mayor, Salem, Ohio.

FIFTH SESSION—Wednesday, May 15—7:30 P. M.

Address—The New Municipal Code—T. H. Hogsett, Esq., Director of Law, Cleveland, Ohio.

Address—The Duties of a Real Live Chief—Mr. E. J. Tracy, Chief of Police, Zanesville, Ohio.

Address—Mr. Allen Ripley Foote, Editor Public Policy, Chicago.

SIXTH SESSION—Thursday, May 16—9:00 A. M.

SEVENTH SESSION—Thursday, May 16—7:30 P. M.

Annual Election of Officers.

Selection of Next Place of Meeting.

NOTES.

Headquarters—City Clerk's Office.

All topics upon the programme, and such other matters as may be brought before the Convention, are open for discussion.

THE NEXT MEETING OF THE LEAGUE.

THE League of American Municipalities will be held at Jamestown, N. Y., on August 21-24, 1901. It is expected to be the most interesting meeting ever held, for the programme committee promises an original line of topics with several novel features which will be sure to call out a larger attendance than ever before. The fact that it will be held so near to the Pan-American Exposition will be a drawing card to swell the attendance also. President James A. Johnson, in writing to the JOURNAL about the next meeting, says:

"The citizens of Jamestown have furnished an excellent hall in which to hold our meetings; one which will be lighted and ventilated. They will also furnish ample space, free of charge, to exhibitors of municipal utilities and devices of all kinds.

"In regard to hotel accommodations, I desire to say that on my recent visit to Jamestown I found them not only ample, but of the very best quality. At the same time I would suggest that rooms be engaged at as early a date as possible."

Mayor J. Emil Johnson, of Jamestown, who will be the host of the League, writes:

"A committee has been designated to have charge of all matters relative to the details for the League Convention here; this committee will also do everything that is needed to make the coming together of the various exhibitors who will desire to be in attendance. Ample space has been reserved for the exhibitors in the hall where the sessions of the League will be held."

In the June number of the JOURNAL will be given a diagram of the hall space which has been reserved for the manufacturing interests. All communications relating to space should be addressed to Hon. J. Emil Johnson, Jamestown, N. Y., or in fact about anything which concerns the convention.

MEETING OF INDIANA LEAGUE.

THE Municipal League of Indiana is progressive as well as aggressive in its work. In its programme this year it devotes an entire session to the ladies, giving them the floor for the whole time. The League is certainly to be congratulated upon the arrangement of its programme. The novel feature is one which will undoubtedly be adopted by other State organizations. The programme follows:

WEDNESDAY MORNING, MAY 8.

The Reception of members by the local committee, who will escort them to the City Hall where they will register, receive their badges and renew old acquaintance.
Meeting will be called to order by President, Hon. Z. T. Dungan, Mayor of Huntington, in the City Hall, at 10 o'clock A. M.
Invocation, Rev. A. J. Frank.
Address of Welcome—Hon. Geo. W. Caldwell, Mayor of Columbus.
Response on the part of the League—Hon. W. N. O'Brien, Mayor of Lawrenceburg.
Selection—Old Tabernacle Quartette, of Columbus—Reeves, Emmons, Hallsley, Cobb; Mason, Pianist.
Roll Call of members and delegates.

AFTERNOON—2 O'CLOCK.

Reading minutes of previous meeting.
Report of officers and action thereon.
The New Street Improvement Law, paper by Jas. T. Merryman, City Attorney, of Decatur.
Discussion, led by Hon. Geo. N. Lawrence, Mayor of North Vernon.
Followed by General Discussion.
Electrolysis, paper by Wm. Schwartz, W. W. Supt., of Huntington.
Discussion, led by Levi Hege, City Civil Engineer of Columbus.
Followed by General Discussion.

EVENING—7 O'CLOCK.

Mayors and Heads of all Departments, Standing and Special Committees will meet in various rooms in City building, designated by the President, to discuss the needs of the different Departments, and make reports at Thursday morning session.

LADIES' SESSION—7:30 P. M.

Music—The High School Chorus, of Columbus (Arthur Mason, Director).
Invocation—Rev. Wm. S. Sigmund.
Music—The High School Chorus.
Are the Curfew and Spitting Ordinances Beneficial? paper by Mrs. Irene Hawley, of Columbus.
Discussion, led by Mrs. Lucretia Armen, of Columbus.
Followed by Mrs. A. E. Rynerson, of Columbus, and others.
Selection—Municipal League Snitzzelbaum Sextette.
The Ladies, God Bless 'Em, paper by J. Fred France, City Att'y, of Huntington.
Vocal Solo—Mrs. John Jewell, of Columbus.
Municipal Ownership of Public Libraries, paper by Miss Jennie Elrod, Librarian of Columbus.
Discussion, led by Miss Zoe Cook, of Columbus.
Followed by General Discussion.
(Intermission of ten minutes for social intercourse and getting acquainted with visiting members.)
Selection—Old Tabernacle Quartette.

THURSDAY MORNING, MAY 9—9 O'CLOCK.

Invocation—Rev. A. Oster.
Report of different Departments and Committees.
The Tramp Problem, paper by Hon. Geo. E. Downey, Mayor of Aurora.
Discussion, led by Hon. J. M. Fraze, Mayor of Rushville.
Followed by General Discussion.
General Discussion upon the Law passed by the last Legislature, changing the length of term of City officers.
Discussion, led by O. H. Bogue, City Attorney, of Wabash.
Adjourn 11:30, in front of City Building, for purpose of taking photograph of all members.

AFTERNOON—2 O'CLOCK.

Selection—Lone Star Quartette, of Columbus—King, Duncan, Johnson, Brown.
Mayors, Their Duties and Powers, paper by Hon. Martin T. Kreuger, Mayor of Michigan City.
Discussion, led by Hon. Ellison D. McGuire, Mayor of Madison.
Followed by General Discussion.

7 O'CLOCK P. M.

Exhibition Drill by Uniform Rank, Knights of Pythias, of Columbus, in front of City Building.

8 P. M.

Banquet.

FRIDAY MORNING, MAY 10—9 O'CLOCK.

Invocation—Rev. M. A. Farr.
Query Box, in charge of Hon. B. F. Deahl, Mayor of Goshen.
Evils from the Sale of Cigarettes and How Shall We Prevent It? paper by Thos. Jessup, City Attorney, Richmond.
Discussion, led by Hon. Thos. B. Rader, Mayor of Jeffersonville.
Followed by General Discussion.
Selection of the place of next meeting.
Election of Officers.
Unfinished Business.
Adjournment.
1:30 P. M., Exhibition of Columbus Fire Department.
Owing to the length of the programme, papers must not exceed twenty minutes.

A "ROUND ROBIN" ON PARK METHODS.

THE Association of New England Park Superintendents has a scheme in operation which its members find useful to a large degree, and below is presented a sketch of the plan.

The scheme is a circulating bulletin, cumulative in its effect. The method employed cannot better be described than to quote directly from the preamble of the bulletin, which is as follows:

"This Bulletin is intended as a medium for the interchange of ideas, the recording of results of experiments, practice, experience, or observation; for questions and answers, or for any other matter that may be proper for the consideration or discussion by the members of this association.

"Will each member avoid delay in the circulation of the Bulletin, by promptly considering its contents, adding a contribution, if possible, then forwarding it to the next member named below on the list, noting in the column prepared for the purpose the date of receipt and remailing.

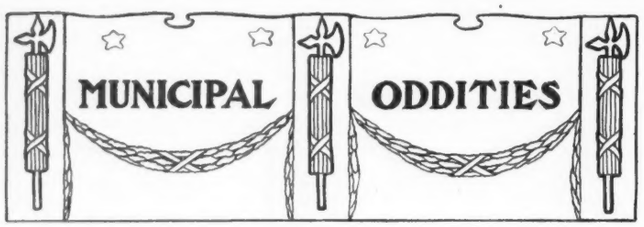
"After these Bulletins have completed their circuit and returned to the Secretary a copy will be sent to each member, so that all will have a set of Bulletins belonging to them.

"Notify the Secretary by postal card of the date of remailing of the Bulletin and its number."

Mr. G. A. Parker, of Kenny Park, Hartford, Conn., one of the readers and contributors to the Bulletin, has this further to say concerning it:

"There is attached to each Bulletin the list of members with their post office address. To each Bulletin is also attached several blank sheets on which the members write their contributions. It is found that usually the members retain the Bulletin only two days each. The circuit should be completed in about two months.

"As a means of receiving and imparting information, of becoming better acquainted with each other, of bringing us in touch with the work, and increasing the sense of comradeship among Superintendents who are necessarily much separated, this Bulletin seems the best means yet devised. It certainly has been a success in the New England States, and if something of the kind was to circulate among the Park Superintendents of the large cities of the United States, I feel it would add to their usefulness, help solve their difficulties and become a source of great satisfaction."



—City Clerk Susdorf of Buffalo, the Pan-American city, recently issued a peanut license to Wojciech Nespesjonly of that city. Who will attempt to pronounce the name?

—The Bison City has an automatic clock in one of its public schools which announces, by the ringing of a bell, the time for closing every recitation. It is the only clock of its kind in the world adapted to school work.

—Interurban Badinage—"Your town," said the Chicagoan, "is called the 'City of Straits,' I believe."

"Yes," replied the Detroiter; "and yours, I suppose, might be known as the 'City of Crooks.'"—Philadelphia Record.

—Mayor Watson of Findlay, O., who, by virtue of his office acts as police justice, recently ordered two boys publicly flogged by the boys' father for stealing $70 in money. The father wanted the boys imprisoned instead, but the Mayor insisted on the flogging.

—In one month's time the Food Inspection Department of Montreal destroyed more than two and a half tons of bread and pastry in the city bakeries. It was pronounced unfit for food. We wonder what there was left for the people to eat during that month?

—City Clerk Hector Gale of Oneida, N. Y., has gone into the playright business on a small scale. His latest production, "Sunshine on the Helderbergs," was recently presented to a crowded house in this city. Mr. Gale's most famous drama is "The Loyal Heart of '61."

—Dr. Parkhurst: "New York is worse than Gomorrah."

Mayor Van Wyck: "New York is the most moral city in the world."

In the eloquent language of the Clodville Clarion: "Whither are we drifting to?"—Virginia Pilot.

—Two women of the town were recently publicly horsewhipped by the Chief of Police of Suffolk, Va., but the dispatches do not state that any men were punished! It is about time for the double code of morals to be placed on the back shelf; it might have been well enough for the last century, but not for this.

—The municipal authorities of Newark, N. J., are about to present a silver medal to Mrs. Charlotte Bergman of that city because, during the practice of her profession as midwife for the past forty years, she has ushered 5,000 young Jerseymen and women into the world. What city can put up better record for encouraging an infant industry?

—The inhabitants of the town of Hiawatha, Kansas, have recently been converted en masse. Since January there have been no criminal cases in the courts, no dances have been held, two shows have been frozen out, there are no liquors sold in town, not even in the drug store, as the druggist was one of the first to be converted, when he destroyed all the liquors in his possession, after which he led a prayer and song service in the street.

—"Your highways are in a deplorable condition," remarked a visitor from Boston to a Montreal alderman. "How do you account for it?"

"Well, you see—that is," the alderman hesitatingly replied, as he sparred for time to think of an excuse; "now, for instance, a-a-a horse tore up this street this morning."

And he heaved a sigh of relief at getting out of it so easily.

—Several residences in Camden, N. J., were recently burglarized during a single night. The burglars left a note behind them in each instance warning the policemen to be careful or they would be kidnapped. This is not quite so bold as a burglar who operated in Troy, N. Y., not long ago, who entered police headquarters during the night while the guard was on watch and walked off with a typewriting machine belonging to the city!

—One of the oddest statements about Greater New York, which has been made for many a day, is that of *The Sun* in a recent issue: "In the boroughs of Manhattan and the Bronx on the night of April 12 there was no fire, no murder, no suicide, no runaway, no person reported missing, no person injured in an accident, no mad dog shot, no sudden death reported to the Coroner, no block on a street car line and nothing happened to anybody in the theatrical profession. The population of the two boroughs is about 2,100,000. We wonder where all the reporters of *The Sun* were on that night? Its reputation for veracity will be ruined if many more such statements appear in its columns.

—Friend—What are you working at now?

Inventor—Greatest thing of the age—a dollar-in-the-slot voting and weighing machine; it collects the poll tax, counts the votes and so beautifully discriminates that there'll be no more trouble, no more politics, no more speeches, no more brass bands, and, best of all, no more boodlers.

'My stars! What's the idea?"

"Simple as A B C. The machine only counts the votes of those under a certain weight. Quick as the party in power begins to get fat on the spoils of office, their votes are thrown out, and the half-starved minority walks in; and when the new party gets fat, it goes out, and so on. It beats all creation! Gives every fellow a chance to become a successful politician."

—When Tom L. Johnson, Mayor of Cleveland, was in Detroit recently he was introduced to a son of the Emerald Isle, who, after looking admiringly at the single taxer's rotund style of architecture, remarked:

"Misther Johnson, I'm glad to mate you. I've read a great deal in th' papers about you, and judgin' from all I hear you ought to be Orish."

"I am," remarked Tom, with a chuckle. "My real name is Thomas McCann. My people were banished from Ireland 300 years ago for horsestealing."

The Irishman looked intently at Tom for a few seconds and then blurted out:

"Excuse me, Mr. Johnson, yer a shmart man, but yer also a dommed liar, for divil the harse there was in Oireland 300 years ago. There was nothin' but asses."—Detroit Journal.

CONVENTION DATES.

MAY.

The National Civic Federation will meet at Buffalo, May 23-24, 1901.

Exempt Firemen's Association of New Jersey, at Bayonne, N. J., May 15, 1901.

The American Society of Mechanical Engineers meets at Milwaukee in May, 1901.

Georgia and Alabama Volunteer Firemen's Association will be held at Cedartown, Ga., May 15-16, 1901.

The Municipal League of Ohio will meet in Cleveland, O., on May 14-16. Dr. S. O. Giffin, secretary, Columbus, O.

Connecticut State Firemen's Association, eighteenth annual convention will be held May 21-22, 1901, at Hartford, Conn.

National Municipal League, Hon. Clinton Rogers Woodruff, secretary, Girard Building, Philadelphia, will meet in Rochester, May 8-10, 1901.

National Conference of Charities and Corrections will take place in Washington, D. C., in May 9-15. H. H. Hart, Unity Building, Chicago, Ill.

National Electric Light Association will be held May 21 to 23, 1901, at Niagara Falls, N. Y. Secretary, Geo. F. Porter, 120 Liberty street, New York.

The National Association of Chiefs of Police will meet in New York City, beginning May 28, 1901. Supt. A. H. Leslie, Pittsburg, president.

The American Society of Mechanical Engineers meets in Milwaukee, May 28-31, 1901. Prof. F. R. Hutton, 12 West Thirty-first street, New York City.

JUNE.

Four County Firemen's Association will meet at Catasauqua, Pa., June 7-8, 1901.

Maryland State Firemen's Association will meet at Westminster, Md., June 12-13, 1901.

The Independent Telephone Association will meet in Buffalo, N. Y., June 11, 12, 13, 1901.

The American Park and Outdoor Art Association will meet in Minneapolis, Minn., in June, 1901.

Firemen's muster at Springfield, Mass., will be held under auspices of the Veteran Firemen's Association, June 20, 1901.

The American Institute of Electrical Engineers meets at Buffalo, June 10, 1901. Ralph W. Pope, 26 Cortlandt street, New York, secretary.

American Water Works Association, Peter Milne, C. E., secretary, will be held in New York City during the week beginning June 17, 1901.

The National Social and Political Conference will take place in Detroit, Mich., June 28-July 2, 1901. D. J. Meserole, secretary, 160 Joralemon street, Brooklyn, N. Y.

The American Society of Civil Engineers will meet at Niagara Falls, June 25-28, 1901. Charles Warren Hunt, 220 West Fifty-seventh street, New York City.

The Canadian Electrical Association meets at Ottawa, Ont., June 19-21, 1901. C. H. Mortimer, secretary, Toronto, Can.

League of Cities of the Third Class of Pennsylvania will hold its second annual session at Erie, Pa., June 26-28, 1901.

JULY.

The American Library Association will meet in Waukesha, Wis., on July 3, 1901.

The Trans-Mississippi Congress will meet in Cripple Creek, Colo., on July 17-21.

Nebraska State Firemen's Ninth Annual Convention and Tournament will be held at Fremont, Neb., July 16-18, 1901.

AUGUST.

The National Firemen's Association meets at Buffalo in August, 1901. D. W. Gillen, 176 Monroe street, Chicago.

"Municipal Day" will be observed at the Pan-American Exposition, August 26, 1901.

League of American Municipalities will hold its annual meeting at Jamestown, N. Y., August 21-24, 1901.

New York State Firemen's Convention and Firemen's week at the Pan-American Convention, August 19-24, 1901.

The American Society of Municipal Improvement meets at Niagara Falls in August, 1901. D. L. Fulton, Allegheny, Pa., secretary.

American Florists' and Ornamental Horticulturists' Association will meet in Buffalo, N. Y., on August 20-24, 1901. William J. Stewart, secretary, 67 Broomfield street, Boston, Mass.

SEPTEMBER.

The Glasgow Engineering Congress, Glasgow, Scotland, will be held in September, 1901.

American Public Health Association will meet in Buffalo, N. Y., September 17-20, 1901. Dr. C. O. Probst, secretary, Columbus, O.

The Virginia State Firemen's Association meets at Staunton, Va., September 25-26, 1901.

OCTOBER.

Western Gas Association will meet in Louisville, Ky., in October.

Pennsylvania State Firemen's Convention and Tournament will be held at Philadelphia, October 1-4, 1901.

CURRENT TOPICS

—Detroit, Mich., has appropriated $9,000 to construct polling booths.

—Montreal is considering a proposition to construct a municipal abattoir.

—The city of Chicago has decided to substitute day labor for the contract system.

—An Albany paper contains the statement that 1,000 cities have curfew ordinances.

—Chicago proposes to construct eight miles of conduits for laying wires underground during the next few wooks.

—Mayor Boothby, of Portland, Me., has sugested that sewing and cooking be taught in the public schools of his city.

—The women of Ogden, Utah, are endeavoring to secure the passage of a law which shall prohibit the use of slot machines.

—Salt Lake City is to have a new Federal building. The bill providing for its construction has passed both houses of Congress.

—The municipal budget of Havana, Cuba, for the current year amounts to $2,350,000, which is $600,000 in excess of that of last year.

—In Baltimire, Md., every gas meter is tested by the Lamps and Lighting department before it is installed in a residence or business house.

—New York City has had a Bureau of Municipal Statistics at work for several years, but it has never published any statistics. Its existence seems to be for the purpose of drawing salaries.

—Camden, N. J., owns the city street cleaning apparatus, and has operated it for the past two years. Half again as much work is done at the same cost as when the street cleaning was done by contractors.

—The city of Baltimore is installing an electric lighting plant in Druid Hill Park for the purpose of lighting it. The surplus power from the pumping station in the park is used, and the work when completed will cost $10,000.

—The Engineers' Society of Western New York, with head offices in Buffalo, desires to extend every possible courtesy to the visiting engineers. The society's rooms will be open during the day, and mail may be addressed in its care, 975 Ellicott Square, Buffalo, N. Y.

—City Engineer R. B. McKinnon, of York, Pa., has recommended considerable new street work, and advises that asphalt be used for the paving. There is hardly a possibility of this work being done in the near future, as the City Fathers are loth to go to the necessary expense.

—Civic conditions in Cuba are greatly improved under United States rule. The past year the death rate in Havana has been at the rate of twenty-three to the 1,000 of population, while for the eight years previous to the Spanish-American war the rate was thirty-five. Even better reports come from Santiago.

—General Russell A. Alger is at the head of a movement to construct a model town near Pensacola, Fla., patterned after the town of Pullman, Ill. Several hundred men are alreay employed in clearing away the timber and grading. The town will have, in addition to residences which will be built on separate lots, churches, school houses, an opera house and all modern city conveniences, such as paving, lights and water.

—There is considerable unfavorable comment in Wilmington, Del., about the Board of Education, which is not accountable to any superior official for its actions. The board handles its own funds, issues its own bonds and makes no reports to any one. Recently it has completed a high school building at a cost of nearly half a million dollars, while a number of the lower grades of the schools are housed in unsuitable rented quarters.

—Robert F. Gibson, who takes his office at mayor of York, Pa., on April 1st, is not only a young man, but an intelligent, progressive municipal office. Mr. Gibson was selected by the Councils to fill the unexpired term caused by the death of Frank Geise, and the people, appreciating the good judgment of the Councils last February, chose Mr. Gibson their municipal executive. Mr. Gibson is a newspaper man by profession, and is just thirty-five years of age.

—Wilmington, Del., has a population of nearly 80,000, and although its police department is metropolitan in equipment, being fully paid, uniformed and supplied with a patrol and police telegraph system, its fire department is a volunteer organization. This department is, however, equipped with modern apparatus, and the city appropriated $36,500 for its maintenance. All the property, houses, horses and equipment are the property of the various organizations. Its service is highly spoken of, and there is no demand for a change.

—Instead of assessing the taxable property in York, Pa., in a lump, as heretofore, at the recent triennial assessment improved lands and improved properties were valued separately, with the result that there was a considerable increase in the taxable value in the total, and a more equitable taxation was made possible. The block system of recording ownership of property has also been introduced and a registry of real estate is being made. No deed can now, or in the future, will be recorded unless it has been registered by the City Engineer.

—Wilmington, Del., provides free lodging in the basement of its City Hall for all the tramps and unfortunates who desire to accept its hospitality. The quarters are directly under the control of the Police Department and a very variegated assortment of individuals are housed in large numbers nightly. The police authorities claim that the free lodging scheme has resulted in a large falling off in the number of petty larcenies and other offenses, although the fact that the whipping post as an institution still prevails may have considerable to do with the decrease in petty crime.

—York, Pa., will soon be in a position to begin work on a sewerage system, designed some time since by T. Chalkley Hatton, of Wilmington, Del. The newly elected councilmen take office April 1st, and most of them are in favor of the sewerage system, which is a needed improvement. Heretofore the sewerage loan bill has been encumbered with other loan propositions, and in consequence has been refused passage. After the Councils have passed the loan bill it will be submitted to the people, and there is no doubt of the final result. The plan drafted by Mr. Hatton proposes some thirty-five miles of sewers, which are to be built of brick and vitrified pipe, and together with the proposed reduction plant to be operated in connection with the system will cost $350,000.

MUNICIPAL JOURNAL AND ENGINEER

PUBLISHED MONTHLY AT 253 BROADWAY, NEW YORK CITY.

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WILLIAM S. CRANDALL, Editor.

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Advertising Department:
E. J. HERMANS.
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Circulation Department:
J. T. EMERY.
PERCY GOLDSTONE.

TERMS OF SUBSCRIPTION.
(In advance.)

United States and Canada	$3.00 per year.
Foreign Countries	4.00
Single Copies, each	.25

Entered at the New York Post Office as second class matter.

NEW YORK, MAY, 1901.

EDITORIAL COMMENT

The courts of Massachusetts have pronounced the voting machine legal. This is a step forward.

The crusade against the bill-board nuisance has just struck Buffalo. It is to be hoped it will land in New York soon.

If New York's Committee of Fifteen will continue to harass the unlawful resorts of Manhattan it will accomplish some good.

Mayor Deihl, of Buffalo, is making a wise move at a late day to provide for a municipal exhibit for that city at the Pan-American.

The anti-spitting crusade seems to have taken another hold; offenders are being punished in New York, Brooklyn, Scranton, San Francisco and elsewhere.

Cincinnati proposes to install filters in all of its public schools. This is a good example for other cities to follow; it is much better than to provide insipid boiled water.

The suggestion is made in Sacramento, Cal., that the Chamber of Commerce nominate a ticket for the approaching municipal election. Why not? What is the matter with that idea?

The methods of the Quaker City in awarding contracts seem to be rather peculiar. What is the use of having any competition if the contracts are not to be awarded to the lowest bidder?

Our readers are becoming more interested in our advertising pages. The advertisements in the MUNICIPAL JOURNAL AND ENGINEER are as valuable to the up-to-date official as any other department.

Last month we gave a table of statistics showing the value of meters in preventing useless waste of water. In this number will be found one of even greater value, because it covers over one hundred cities.

The Pan-American Exposition was badly damaged by the recent storms and the ceremonious opening will, therefore, be postponed until April 20, when it is promised to have all things in readiness for the visitor.

The sincerity of the faith curist or Christian Scientist who would treat smallpox in his peculiar way is not to be questioned, but where do the rights of the other fellow—who, by the way, represents the vast majority—come in? Has he no rights in the matter?

The women of South Park, Chicago, are employed these days in cleaning the streets in front of their respective residences. Where are the men, and where is the street cleaning department of the Windy City? Here is another good opportunity for Mayor Harrison to demonstrate his effectiveness.

The wheels of the great International Show at Glasgow are now in motion. While the United States Government rather ignored this opportunity to show its multiplied industries in a formal exhibit, the enterprising manufacturers have made a showing of which the Yankees need not feel ashamed.

Cleveland had a storm last month which damaged the various wire systems of the city, and, as a result, there were many live wires lying around loose, by which several horses were killed and many persons injured. Here is a chance for the Hon. Tom to do something worth doing—put the wires under ground.

Winnipeg, B. C., recently opened a school for manual training for boys. Here is a better chance for Mr. Carnegie to get rid of some of his surplus millions than to invest them in libraries. Cooper Union, the Armour Institute and similar enterprises have greater possibilities for self-help than any library.

The New York councilmen went to a funeral the other day, and now the city is asked to pay hundreds of dollars for badges, gloves, carriages and other "signs" of grief(!). Is it not about time for New York City to shake off some of its provincialism? Chicago aldermen are more up-to-date; they pay their own expenses when they attend the funeral of a brother alderman. Step more lively, Mr. Knickerbocker!

SOME of the newspapers in cities of the second class, of New York State, are growling because the aldermen of those cities have succeeded in getting an amendment to their charters providing for a salary. The possibility of earning a salary as an alderman is equal with that of any other city official, and he is equally worthy of his hire. The newspapers would be better employed in showing up the record of those aldermen who do not earn a salary.

Beware of the strap in the street railway car, for the deadly disease germ hides within its fold. Infection from one of these straps caused the serious and almost fatal illness from blood poisoning of a New York woman recently. Life in the city is becoming a serious question, for death lurks everywhere. A greater menace to public health is the trailing skirts of the women who daily sweep the streets and then carry myriads of germs into their homes. What will the Health Officers do about the matter?

The New York Legislature has passed a law which places automobilists outside the control of municipalities. This is class dictinction with a vengeance. There is no good reason for giving this favor. All other driving, riding and even walking, on the streets of a city or in the parks is governed by certain rules, and rightly so. There is no vehicle more dangerous than the automobile; it should be subject to municipal control the same as any other vehicle, and to have this special privilege is an infringement on the rights of others.

RECENT MUNICIPAL ELECTIONS.

THE chief issues in the leading western municipal elections last month were the public ownership of natural monopolies and the control of franchises.

Carter H. Harrison was elected Mayor of Chicago for a third

term despite the opposition of a strong faction in his party led by ex-Governor Altgel. This third term comes to him as a reward for his championship of the people's interests in street railway franchises. He is an exceedingly fortunate young man, who, having made serious mistakes in the past, should be wiser and better for them. He has a splendid opportunity to improve the city's police service, to provide against further waste and scandal in the public works department, to perfect the civil service regulations and to bring to a satisfactory close the street railway franchise controversy. Mr. Harrison is to be credited with having commenced some of these needed reforms. During the past year he has so improved the civil service commission as to have gained the confidence of the public; he has opened the way for reforms in the department of finance, the park and street railway commissions.

The most spectacular election of the lot was that of Cleveland, where Tom L. Johnson was elevated to the Mayoralty. Politicians see in this event an open door to greater possibilities. Be that as it may, he is Mayor of Cleveland now, and has already shown his ability and given the citizens of that city reason to expect the most aggressive administration it has had in many a year.

His watchfulness for the people's interests was signalized by his first act, which followed closely the announcement of the returns, when he prevented his predecessor from signing away for a song valuable property and franchise rights belonging to that city. Vigilance, promptness and justice to the whole number of citizens appears to be the keynote of his administration. He has started in to enforce all the laws and ordinances on the statute books, whether they be objectionable or not; he has inaugurated a movement for the equalization of taxes—a system which will make the franchise owners bear their just share of the burdens of taxation. In fact he has set out to win public favor by meriting it.

Tom Johnson has been called a robber baron, because he has made his fortune out of special privileges granted by the people and out of high street car fares. And now he is the champion of the people and an advocate of three-cent street car fares. "Let the world cry, Inconsistent! Insincere!" said a friend of his. "He at least had the grace and the honesty while grabbing his millions not to make a pretence of philanthropy. He did not play the hypocrite then. The people apparently believe he is not going to begin a career of hypocrisy now. Tom Johnson is rich beyond the avarice of the average man. He has thrown off business. He has sold out his street railroads and his steel plants. He has put his millions into gilt-edged bonds. All he will have to do for a livelihood will be to clip coupons and sign checks. He says he is going to devote the remainder of his life to the welfare of the people." For the next two years he will have an opportunity to demonstrate his sincerity of purpose, ability and quality of justice in administrating the affairs of this growing western city.

"Golden Rule" Jones, of Toledo, was another successful candidate for a third term. His first election was as a "dark horse" put up by the Republican party. He was not sufficiently tractable to the party leaders who had exalted him and so he was turned down at the next mayoralty primaries. Nothing daunted, he announced himself as an independent candidate and polled nearly three-quarters of all the votes cast. His recent election was by a very much reduced majority, which was undoubtedly due to a lack of organization. In a signed public statement he said:

"The election is a complete triumph of principle over party. From beginning to end the non-partisan campaign was a campaign of faith in the highest and noblest sense of the word; faith that the people can do their own thinking, nominating by petition and voting without the aid of caucuses, primaries, self-constituted bosses or party kings of any sort. We have no 'Headquarters,' not a single committee; nobody has been asked for a dollar, and no one has been promised a thing. The slogan of the campaign has been: 'Own yourself, always vote, be free.'" Had the usual organization been maintained it is quite probable that his majority would have been greatly swelled.

In Columbus, another Ohio city, Mayor Hinckle, a comparatively unknown man, was elected. The vacillating attitude of the former administration toward the street railway franchise controversy and other important issues, together with the same weakness of the Republican nominee, is said to have made his election possible. Mr. Hinckle has commenced a vigorous overhauling of all departments, and, according to press reports, is meeting with success and receiving public approval.

A national influence was introduced into the St. Louis campaign by a gentleman from Nebraska in an endeavor to defeat Rolla Wells, a Gold Democrat, but he was elected by a large majority. There was much fraudulent voting by gangs of repeaters, and in one of the riots the United States District-Attorney was shot twice, but not mortally wounded. Mr. Wells is a young man and was heartily supported by the young men of both old parties. He has assumed responsibilities which would overawe an older man. It is to be hoped that he will take counsel with some one besides the "ring." In no other way can a sagacious, honest and efficient administration of the city's affairs be obtained.

The results of the election of last month, not only in these large cities, but also in most of the smaller ones, show a tremendous growth of sentiment in favor of municipal ownership; they were a distinct protest against franchise grabbing and the corrupt and unbusiness-like method of disposing of municipal franchises; a protest against machine rule of any party. These protests, whether right or wrong, must be recognized and reckoned with.

A CHARTER FOR GREATER NEW YORK.

When the charter of Greater New York went into effect, January 1, 1898, predictions were frequently made that amendments would soon be necessary. In fact it had been in operation scarcely two years before a bill was introduced in and passed by the Legislature authorizing the appointment of a Charter Commission by Governor Roosevelt. This commission, composed of representative lawyers and business men, began its arduous task early in 1900 and submitted its report to the Legislature soon after the opening of the session just closed.

However much one may differ with the report of the commission, it deserves universal commendation for the thorough and painstaking way in which it went through the charter, article by article, section by section, line by line and even word by word. Citizens representing every kind of opinion were requested to make suggestions and after thorough discussion with the city officials themselves, the following principles were adopted as fundamental:

(1) The substitution of a single chamber of 123 members for the present dual municipal assembly.

(2) The extension of its powers.

(3) The centralization of administrative responsibility in the Mayor by giving him unlimited power to remove most of his appointees.

(4) The decentralization of most of the public works, excepting the water supply, by placing them under the jurisdiction of the borough presidents.

(5) The devolution of the powers of the board of estimate and appointment and of the Board of Public Improvements upon a single board made up of elected officers.

In spite of the prevalent desire that the charter as amended by the commission should be passed without alteration, the Legislature insisted upon making changes, most of which were ill-advised and strongly denounced in the city. As is necessary under the constitution, the statute was then submitted to Mayor Van Wyck, who vetoed it. His message to the Senate was a strong statement of the objections to the bill, and pointed out several features which should have received more consideration than was given them. The bill was again passed, however, without the change of a jot or tittle and sent to Governor Odell, who at once signed it. It will become a law January 1, 1902, except a few provisions which go into effect at once.

All in all, the new charter is probably an advance over the one now in force, although there are a few weak spots. The most important change, and the one which has attracted most attention, is the change in the Board of Estimate and Apportionment, which is virtually a local legislative body, for the Municipal Assembly has a few powers and inefficiently exercises them. The Board of Estimate

and Apportionment was founded in 1873, and for twenty-eight years has been composed of the Mayor, Comptroller, President of the Council, President of the Department of Taxes and Assessments, and since 1891 of the Corporation Counsel. Its administration of city affairs has almost invariably been wise and satisfactory to the city at large. Under the new charter, the Corporation Counsel and the President of the Department of Taxes and Assessments will be removed and the presidents of boroughs added to the number. The voting power of each is not equal, the Mayor, Comptroller and President of the Board of Aldermen having three votes each, the Presidents of the boroughs of Manhattan and Brooklyn two votes each, and the remaining members one vote each.

It is doubtful, however, whether by reducing the influence of the borough presidents it will be possible to prevent the intrusion of local animosities and the strong desire to spend public funds. For twenty-eight years the board has given excellent results, and it seems contrary to all experience to expect that with a change in membership the tone and character of the work will remain unimpaired. Indeed, it seems extremely unfortunate that both the commission and the Legislature should so far disregard experience as to attempt to reconstruct what has never been criticised, but universally trusted.

The increase in the importance of the Mayor by the extension of the power of removal meets with general approbation. If he is to be the head of the administrative service, as seems to be the trend in American municipal development, he certainly should be authorized to remove heads of departments, not only during the first six months of his term, as was the case under the old charter, but for the entire term. Unquestionably this centralization of responsibility is wise and will be productive of good results.

The changes in the Board of Education seems to be in the right direction, although there is not entire agreement in this respect. The old charter attempted to centralize school administration in some respects while leaving to the borough wards in large measure the actual administration of the schools. This system was unsuccessful and responsibility was divided and different parts of the educational machinery were constantly coming into conflict. Under the new charter there will be one school board for the entire city composed of forty-six members appointed by the Mayor from the various boroughs apportioned according to population. This board will have complete control of the educational administration of the city, although the charter has provided for forty-six local school boards, whose functions seem to be confined to minor local matters, although recommendation may frequently be made to higher authorities upon more important subjects. This is an attempt to arouse local interest and pride in the public schools. How far this will be successful is doubtful, but it certainly deserves to succeed.

Sooner or later the plan of legislating upon unimportant as well as important matters must be given up. It is not only detrimental to the interest of the city, but to the State as well, for matters of general interest are often given little consideration in the struggle of each legislator to secure the enactment of his local bill. Many acts conferring universal privileges or making important changes in the statutes are frequently passed without due consideration owing to the congested condition of legislative business. Thus the interests of the State demand that some system be evolved for treating purely local matters in a different way. In foreign countries the problem has been successfully solved, and legislators would do well to investigate their methods and work out a similar system, but suited to American conditions.

MILO ROY MALTBIE.

WANTED; BETTER SANITATION.

THE progress of the science and art of medicine during recent years has been responsible for the evolution of a new sort of physician, the specialist; ophthalmologists, otologists, dermatologists, and others have sprung up in the wake of modern medical research. And as physicians interested in any one branch have increased in number they have sought to avail themselves of one another's experience by the organization of societies, local and national. In the development of every specialty it has been a question only of time as to when the workers in it would somehow or other get together. And it has not been in medicine alone of the sciences that organization and co-operation have been the rule. They have during recent years characterized all scientific work and all administrative work which has had science for its basis. The fact is that the number of societies and associations of various sorts has now become so large that it seems high time to call a halt, and to devote future effort to the improvement and possibly to the consolidation of those which already exist.

In no branch of medical science has more rapid progress been made recently than in the matter of sanitation; that is, in the science of avoiding and preventing disease. But while so far as the health of any individual is concerned he can rely to a certain extent upon his own intelligence and effort, observation has shown that the dweller in a city is in some respects powerless to protect himself against the unsanitary conditions incidental to city life, and especially against the sanitary crimes of his neighbors. Such factors have led to a better appreciation of the responsibilities resting upon our municipal health departments, and is leading to a more general recognition of the value of the work done by them. A few years ago it was not uncommon, and was thought quite feasible and eminently proper for a busy physician to undertake to direct the affairs of a municipal health department merely as an incident to a large and growing practice. With a better conception of the value and nature of sanitary science, however, there is now growing up in this country a class of municipal health officers who are devoting their entire time to the study of problems of municipal sanitation, who are in fact specialists quite as much as is the ophthalmologist or the laryngologist, or any of the others. Such changed conditions have been met abroad by the establishment in some of the great universities of courses for the special training of health officers. A similar plan has been proposed in this country, but thus far without practical results. Until there are more cities which appoint their health officers on the basis of merit only and offer them reasonably secure tenures of office, it is hardly likely that a sufficient number of young men will be willing to devote two or three years to the study of sanitary science to make special courses along such lines even self-supporting.

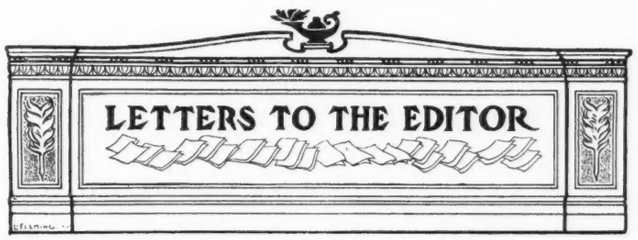
Until there is a radical change in the method of administering our health departments our health officers must be recruited from the ranks of physicians generally, and must fit themselves for their work, if they do so at all, after their appointments and largely in the hard school of experience. There are books galore on the subject of hygiene which will inform one promptly as to what should be done, but the way to do it must be learned afresh by each new health officer either from his own experience or from that of his predecessors; and in this method of learning errors seem to propagate themselves. As things now are there are almost as many ways of accomplishing a given result as there are municipal health departments. Yet there must be some one way better than the others, or at least some principle which should be a safe guide to action. The question to be answered is, how, under existing circumstances, can this best way or this guiding principle be discovered?

So long as our health officers do not get together as health officers to discuss administrative matters, this query will remain unanswered. True, most of our health officers are medical men and meet more or less frequently at the numerous medical conventions, but the papers and discussions at such meetings turn upon questions of science rather than upon questions of administration. The same thing is true, though possibly not to the same extent, with reference to the meetings of the American Public Health Association. Its membership consists largely of persons not actively engaged in the administration of municipal sanitary affairs, and the organization as a whole cannot be expected to devote any considerable part of its time to the discussion of the executive work of health officers. A need similar to that now felt by those charged with the administration of the sanitary departments of our city governments was realized several years ago by those connected in a similar manner with the governments of our States and of the provinces of British America, and led to the institution of the Conference of State and Provincial Boards of Health. But, as its name indicates, that organization does not meet the needs of municipal officers.

A suggestion as to what is needed under present circumstances may possibly be found in the comparatively recent action of the American Public Health Association in organizing a "laboratory

section." The origin of this section seems to have been the practical necessity felt by workers in public health laboratories of an opportunity to get together from time to time to discuss their work with reference to methods and results with a view to standardizing them, and for the purpose of learning from one another the merits and the defects of new methods. If the necessity for such co-operation exists among laboratory workers, is it not at least equally great among those who have generally to supervise such laboratories and much else besides? And why should not the American Public Health Association meet this need by the organization of a section devoted specifically to the work of municipal health officers? Such a section might possibly include the work of our State and provincial boards of health with advantage. There is apparently no reason why such a section should not be organized with as little interference with the general work of the association as was the laboratory section. Then, too, a section of this sort would tend to bring to the annual meetings many men who do not feel that they can afford to attend at their own expense, and who cannot ask the cities which they serve to defray their expenses because the association does not deal to any great extent with what is strictly their official duty.. The organization by the American Public Health Association of a section on municipal sanitation along the lines proposed would, it is believed, tend to standardize methods of municipal health work and add to the well-deserved laurels which the association has already won.

WM. C. WOODWARD.



COST OF TOPEKA'S STREET SIGNS.

TOPEKA, Kan., April 23, 1901.

Editor MUNICIPAL JOURNAL AND ENGINEER:

Replying to your favor of the 17th, we have in this city about 850 crossings filled out with plates as shown in the April issue of THE JOURNAL. We only use these plates, so far, on paved streets, but will begin this year to replace the old wooden crossing plank with them. They cost us $7.50 per set of three plates, making a crossing two feet by six feet wide, with a clear waterway underneath. The street name is only cast in the centre plate, the outside plates being the same for all crossings. The name is made by placing on the pattern cast letters that can be removed and others put in their place, so you see the cost of the sign is nothing—in fact, the foundrymen make no difference in a name plate or plain one in their charges.

P. L. WISE.

"TWO OF A KIND."

YONKERS, N. Y., April 22, 1901.

Editor MUNICIPAL JOURNAL AND ENGINEER:

I was a subscriber to *City Government* from its beginning, and noticed its gradual improvement year by year until it was merged into the MUNICIPAL JOURNAL AND ENGINEER, which proves to be another and decided step in advance in many ways.

The paper is good, the printing fine and neat, the editorial style good—quite up to the standard one would expect to find in such a paper—and the system of advance information very good indeed.

THE JOURNAL has a large and important field to work in, and it should be in the hands of every enterprising city official, engineer, etc., who may be interested in municipal affairs. I am pleased with it, and always find something of value in every issue.

G. L. CHRISTIAN, C. E.

MEMPHIS, Tenn., April 24, 1901.

Editor MUNICIPAL JOURNAL AND ENGINEER:

I herewith enclose you P. O. order for $6 for subscription to your valuable journal. I must confess that THE JOURNAL, for anyone in in the municipal harness, is indeed of great value. Its articles are at once timely, bright and full of good common sense—something that is badly needed in municipal administration affairs as in other lines.

We are getting ready for our United Confederate Veterans' National reunion, which will be held here on the 28th, 29th and 30th of May, 1901. This event will be the grandest ever seen in the South, and well worth representation by any journal. The latch string hangs without and the entire universe is most cordially invited.

WILLIAM LA CROIX.

METERS RECOMMENDED BY ALL MEANS.

GOWRIE, Ia., April 26, 1901.

Editor MUNICIPAL JOURNAL AND ENGINEER:

We are putting in a water plant here, and I have the following questions to ask: (1) Would you recommend the use of meters? (2) What is the usual rate charged per 1,000 gallons? (3) When no meter is used what is the usual rate per family per year?

(1) If your water supply is to be pumped, the use of meters is urgently recommended; if you are to have a gravity system of distribution with a limited supply, it would be wise to put them in also; but if the gravity supply happens to be practically inexhaustible so far as the needs of your town are concerned, then the meter would not be so essential to the success of the plant.

(2) The rates charged for water by the 1,000 gallons ranges all the way from 2 cents to 60 cents, the highest price being that of some private companies. To determine an equitable rate for your system it would be necessary for you to first ascertain the net cost per 1,000 gallons and then add a reasonable amount to allow for extensions, sinking fund, interest, etc.

(3) Before a flat rate can be established, as in the case of the use of meters, the net cost must be established and due provision made for extensions, etc. The following table, taken from the American Water-Works Manual, shows the practice of the smaller municipalities in Iowa:

FIXTURE RATES, DOLLARS PER YEAR.

Cities.	Family.	Water closet.	Bath tub.	Wash bowl.	Horse and carriage.	Hose.
Ackley	6	3	2	0	5	3
Alton	5	—	0	0	3	3
Audubon	4	3	—	—	5	M.
Bellevue	6	3	2	0	—	4
Belmond	2	Sp.	1	0	1	2
Clarksville	5¾	3	3	—	3	6
Coon Rapids	Meter System in Use.					
Eagle Grove	5	—	3	—	—	—
Eldora	6	3	3	0	3	4
Emmetsburg	6	3	3	0	3	4
Glenwood	6	—	—	0	—	6½
Jefferson	6	2	2	—	1½	—
Lake City	6	3	1	0	3	5
Lisbon	5	3	0	0	3	3
Logan	4	—	2	—	2	4
* Marcus	6	—	—	0	3	5
Marengo	3	1½	¾	0	1	2
Maxwell	5	3	—	—	2	5
Oakland	7½	3	—	—	1	3
Postville	5	3	2	0	3	5
* Rock Rapids	5¼	—	2½	—	—	Sp.
Sheldon	5	5	3	0	2	5
Spencer	6	3	3	0	3	4
Villisca	6	4	0	—	2	—
Waukon	5	3	2	0	3	5
West Bend	6	3	0	0	3	2½
West Liberty	6	3	2	0	—	3
Williams	4	3	3	0	2	2

* Private ownership.
M.—By meter, only.
Sp.—Special.

A PLEA FOR WIDE TIRES.

KANSAS CITY, Mo., April 4, 1901.

Editor MUNICIPAL JOURNAL AND ENGINEER:

I believe in good roads and in the good roads movement, and I can see how the "Good Roads Train" will accomplish a large amount of good in this field of needed improvements; but I do not see that there has been any provision made for emphasizing the use of the wide tire. This is an omission, if it has been omitted, which I hope will be remedied by Mr. Earle in his crusade for good roads. In my opinion the work of this good roads train will be lessened in its

good results unless there be included in the equipment the necessary apparatus for demonstrating the efficiency of the wide tire in maintaining good roads after they are once made.

I consider this phase of the subject the prime factor in the general scheme, and I should like to accompany this good roads train upon its journey about the country and work up this important feature.

More careful tests should be made to show the difference between the use of the broad and narrow tired wheel in its relation to the destruction or preservation of the public highways. It is not sufficient to show that a wheel of double a given width pulls, say 12 per cent. easier than one which is half that width for a single trip, but we must find the cumulative effect of many trips under favorable weather conditions.

Passing over clay roads, considered in the light (?) of pug mills, let us consider a strip of macadam as forming a part of the surface of a great grind stone (the earth), and suppose the wheels to be in process of grinding. We use horse power to do the grinding down of the tires, and we occasionally spill on water to facilitate the process. Now since we want the least effect upon both tire and grindstone, what width of wheel shall we grind? If we keep up the thing for a good while with two wheels of fair test width, say one of average present width and the other of proper fixed width, shall we not find that the difference in effect upon wheel and surface and in pull upon horses, increases rapidly after a given length of time with the number of tours.

I find exactly this thing true of asphalt here in Kansas City. Small depressions due secondarily, at least, and mostly, to inadequate wheel width, are rapidly ground out into holes, and these more rapidly into deeper and larger holes, until the expense for repairs grows into large proportions, which is needless. J. M. HEISKELL.

HAMILTON'S TAR MACADAM.

BOSTON, Mass., April 20, 1901.

Editor MUNICIPAL JOURNAL AND ENGINEER:

The method employed in Hamilton, Ont., in building what they call "tar macadam" is one which has never accomplished the best results when used in any kind of bituminous or hydraulic concrete work. Good municipal authorities who have inspected the work have been heard to say that they accomplished better results in macadam road building in Massachusetts without using any bitumen whatever.

The method has been to take mineral grains of varying sizes, but separated into comparatively equal sizes, and lay it in courses, coating each size by itself with tar, and depending upon a roller to combine them together. While the roller, in fact, merely combines the top of one size with the bottom of the succeeding layer, and the result is a concrete filled with air spaces, subject to movement and dislocation under traffic. This may not apply to an early piece of work done in Hamilton by the Gas Company under conditions which are not carefully recorded, and which the writer has heard stated developed a road which for a short time at least was so soft and spongy that it was objectionable.

Any given size of sand or mineral grain, whether one two-hundredth part of an inch in diameter or from that to two inches in diameter will develop from 40 per cent. to 50 per cent. of voids when compacted. The coating of any even grain with a bituminous cement does not fill the voids, and the physical nature will rapidly change under atmospheric influences, due to the air and water percolating through the concrete, evaporating the oils of the bitumen, and the life of such a concrete is greatly reduced. A bituminous concrete which might develop twenty to forty years of life, if the bitumen was closely confined and not exposed to the air, might, if made with a mineral grain having too much voids, be changed by evaporation and oxidization, within a few months, to such an extent that the concrete would be comparatively worthless. Of course, mineral grains in practical construction are not of exactly the same size, and there is more or less variation, but under the Hamilton system the voids in the mineral matter have not been reduced to a minimum, and the life of the concrete will necessarily be much shorter than where the various sizes of grain are mixed together from an impalpable powder to a stone two to three inches in diameter.

Another exception that can be taken to the Hamilton method is that they call their work tar macadam. Tar for the purpose of building macadam roads should be treated and made into a composition which is heavier and less liquid than tar, and all of the oils in the tar subject to quick evaporation should be removed.

Hamilton also has made errors in assuming that a tar bitumen, because it works easily, is going to develop great life, and has made the mistake of using one of the most volatile tars produced in the United States, and one which has a very short range of flexibility.

While there is undoubtedly great merit in a properly constructed bituminous macadam road, it is safe to say that if laid with materials not carefully selected, and on the Hamilton principle of construction, such roads will be as great an economic failure as were the early tar pavements of the sixties and seventies.

It has been demonstrated to a certainty that a carefully selected bituminous material, when mixed with mineral grains, properly selected, with a view to getting the greatest density, will, when mixed together properly, develop a roadway surface which will stand from twenty to thirty years under light traffic.

It is equally true that the hap-hazard methods of using coal tars in concrete construction has developed surfaces which have not had an average life exceeding three years, and careful engineers who are not bituminous concrete experts have properly formed the opinion, judging from the methods employed, that the coal tar bituminous concretes have been a commercial and economic failure.

In this connection I beg to comment on the short paragraph under the head of "Parks" in your April number, which reads as follows:

"Tar concrete walks at one time averaged twenty years of usefulness, but nowadays, owing to the deterioration of tar, their life is barely five years."

The above is partially true, but largely in error. The writer would like to see the authority who can show that the best quality of tar produced to-day is not equal to the best quality ever produced, and he also questions if the average life of tar walks was ever twenty years.

The facts are that tar concrete walks have never been laid with any degree of uniformity, and while some walks have developed a life of forty years, the average life has never been over five years, take the country as a whole.

The fact that the tars produced to-day vary more in quality than heretofore, and the fact that no manufacturer of tar bituminous materials has been careful in the selection of his tar, and no manufacturer of bituminous concretes has heretofore adopted scientific methods of preparing the same, furnish the conditions which justly place the tar bitumens in the background as being unserviceable.

The writer is one of the few who believes that the tar bitumens will furnish for the bituminous concrete construction of the country a more suitable material for half of the uses and conditions than do the asphalts which are considered standard at this time.

The greater waterproofing qualities and the greater adhesiveness to mineral grain of the better class of tar bitumens, as well as the fact that it is not subject to decomposition, except by evaporation, completely offsets for many purposes the only two advantages possessed by asphalt bitumens, viz.: less susceptibility to evaporation and slightly longer range of flexibility. F. J. WARREN.

A MUNICIPAL GREENHOUSE.

NEW BEDFORD, Mass., April 22, 1901.

Editor MUNICIPAL JOURNAL AND ENGINEER:

We have recently installed a greenhouse in connection with the Oak Grove Cemetery, which is maintained at the city's expense, and it occurred to me that your readers might be interested in such a novel feature.

It having been necessary in previous years to incur a large expense to supply the numerous flower beds of the several cemeteries of New Bedford annually with plants and the fact that these flower beds were becoming more numerous because of the yearly extensions and developments of the cemeteries, the Cemetery Board believed that better results could be obtained by the installation of a conservatory plant at the cemeteries.

A sufficient fund had accrued from the sale of lots to warrant a movement in this direction without calling for a special appropriation for the purpose. Subsequently, a greenhouse 90 feet long was built, thoroughly equipped with modern appliances and an up-to-date potting house was annexed for the purpose of slipping, potting and handling bedding plants in the most efficient manner. A new "Bundy Heater" was installed—the best, we believe, for greenhouse work. An experienced gardener is placed in charge of the plant, and his duties extend to the bedding of the plants in the several cemeteries as soon as the weather will permit of their transplanting. We have now upward of 20,000 plants of many varieties, in a healthy and thriving condition, ready for transplanting—the cost of which does not exceed the sum of five dollars for cuttings.

It is unnecessary to go into the extended details as to the many advantages to be derived from nurseries and greenhouses in the cemeteries, yet we believe they are almost indispensable from an economical and financial point of view. They are practical auxiliaries, and their value and importance can only be realized when such things are established and operated. Aside from, and far above the financial value, is the incentive it gives to collect and grow on our own grounds, a varied collection especially adapted to the climate in which we live.

CHARLES H. VINAL, *Secretary.*

PERSONALITIES

—Mr. William F. Bryan was the successful Mayoralty candidate in Peoria, Ill.

—Mr. John W. Miller has been re-appointed the City Engineer of Sandusky, Ohio.

—Mr. A. P. Smith was recently re appointed as City Engineer of North Tonawanda, N. Y.

—Hon. M. M. Stephens was recently elected Mayor of East St. Louis for the seventh time.

—Mr. Jepp Ryan is the new Mayor of Leavenworth, Kan. He was sworn in by City Clerk Przybylowicz.

—Colonel J. W. F. Hughes was elected Mayor of Topeka on the Republican ticket by a majority of nine votes.

—Judge John P. Studley is the new chief executive of New Haven, Conn. He was elected by a plurality of 999 votes.

—Mr. John R. Murphy has been appointed Recorder of Allegheny by Governor Stone, under the "Ripper Bill."

—Mr. Frank P. Hill, formerly librarian of the Newark library, has accepted the appointment to a similar position in the Brooklyn library.

—Mayor Mims, of Atlanta, Ga., meets the heads of the various departments of that city every Saturday morning for the purpose of discussing the affairs of the city.

—Mayor James M. Head, of Nashville, Tenn., has been the means of organizing a State Municipal League, similar in purpose to that in Pennsylvania, Ohio, and elsewhere.

—Major Adam M. Brown has been appointed Recorder of Pittsburg by Governor Stone, who fills the office of Mayor, formerly occupied by Mr. W. J. Deihl. This is Pittsburg's first appointment under the "Ripper Bill" recently passed at the instigation of Hon. M. S. Quay.

—Dr. William C. Woodward, Health Commissioner of Washington, D. C., and Captain L. H. Beach, Engineer Commissioner, visited New York recently for the purpose of investigating the various municipal hospitals. Congress has appropriated $5,000 for the purpose of preparing plans and specifications for a new municipal hospital soon to be built in the Capital City. These gentlemen will visit Philadelphia, Baltimore, Boston, Cleveland and Albany before settling upon any plans.

PUBLIC UTILITIES

SOME GERMAN WATERWORKS FIGURES.

THE following figures relating to German water works are made up from the latest available figures:

DUSSELDORF—Year ending April 1, 1900. Population, 212,919; consumption by meter, 69.92 per cent. of total; total consumption, 2,272,054,500 gallons; price for metered water, 10.5 cents per 1,000 gallons; receipts per thousand gallons of water supplied, 8.6 cents; length of street mains, 121.5 miles; number of meters in use, 7,185; increase in consumption over previous year, 11.21 per cent.

DRESDEN—Year ending December 31, 1899. Population, 395,349; total consumption, 3,725,355,900 gallons; greatest daily consumption, 14,612,930 on July 22; least daily consumption, 6,207,175 on February 26; receipts per thousand gallons water supplied, 10.75 cents; daily consumption per head per day, 23.88 gallons.

LEIPZIG—Year ending December 31, 1899. Population, 455,120; total consumption, 2,865,732,700 gallons; greatest daily consumption, 12,427,800 gallons; least daily consumption, 4,850,470 gallons; receipts per thousand gallons water supplied, 9.9 cents; number of meters in use, 12,957; length of street mains, 223.9 miles.

ELBERFELD—Year ending April 1, 1900. Population, 156,503; total consumption, 1,983,873,000 gallons; greatest daily consumption, 7,635,150 gallons; least daily consumption, 2,487,900 gallons; receipts per thousand gallons water supplied, 9.9 cents; number of meters in use, 6,716.

MUNICIPAL GAS WORKS IN SWITZERLAND.

A GOOD illustration of the care and attention to detail which is found in Continental cities is to be had in the case of the new municipal gas works at Zurich. First a commission of experts was called to lay out the plans for the works, and their report was then submitted to a commission composed of the City Engineer, the Gas Engineer and the Water Engineer. This Commission drew up the general plan and then the City Architect's office designed the buildings and arranged the drainage. Then another city department assumed the testing of materials and the Electric Department arranged for the electrical installation. The water department laid a special main, and with the aid of other departments provisions were made for workmen's baths, and dwellings and restaurants, and rates of board were fixed. So far as expert work could determine everything possible is arranged to be done mechanically, and the manual labor is reduced to a minimum. These works were built with the proceeds of a loan of $1,600,000, and were entirely completed in fifteen months from the date of beginning.

They are of a capacity of 3,500,000 feet per day, largely in excess of the present needs of a city of about 100,000 inhabitants and are considered by all gas engineers to be a model installation. Such care is not often found in laying out public works in America and in consequence the economic results of such works are better in Europe than here.

EFFECT OF WATER METERS ON WATER CONSUMPTION.

BY GEORGE I. BAILEY, M. AM. SOC. C. E.

Conditions arising in the operation of the water-works of the city of Albany made it desirable for its officers to have information concerning the water supply of other cities.

The conditions were, an enormously increased consumption of water during the winter, almost an even rate of consumption for each hour of the 24, and an insufficient pressure in high portions of the city, all of which created an urgent demand for furnishing greater quantities of water, which meant a general addition to our plant, or else methods for restricting waste.

The general conditions are not new, and as they either have occurred, or will occur, in almost every city, they are assumed to be of interest to water-works officials. All of these conditions sum up in the question of, whether it is cheaper and better for water takers to waste water or not to waste it. It is an easy matter to give reliable estimates of cost for increasing the plant, and for furnishing and placing water meters. There is a lack of information as to how well water meters will control the supply, their life, their operating cost, and their effect upon the water takers' pocketbook. Although there is an abundance of evidence as to what has occurred in especial cases and locations, we know of no general summary.

For our information we wrote to every city in the United States having a population of 25,000 people or over, by the census of 1900. We received replies from 136 of the 159 cities. Available information on quantity of water furnished daily was given by 134 cities, having an aggregate population of 17,650,000. Available information on receipts from water was given by 102 cities, having a total population of 15,814,000. In each case the population represents more than 20 per cent. of the total population of the United States. The locations of the cities are widespread, and therefore the averages are representative. The cities which refused information were generally those whose water supply was controlled by private companies.

We find the average per capita consumption in these American cities to be 137 gallons. The effect of placing water meters is as follows:

Taps metered.	——Consumption—— Daily, per capita, gallons.	Per ct. of Av.
Less than 10%....	153	112
10 to 25%.....	110	80
25 to 50%.....	104	76
More than 50%.....	62	45

TABLE I.—WATER CONSUMPTION, USE OF METERS AND RECEIPTS FOR WATER IN OVER ONE HUNDRED OF THE LARGEST CITIES OF THE UNITED STATES.*

(Compiled from Special Official Reports by George I. Bailey, M. Am. Soc. C. E., Superintendent of the Bureau of Water, Albany, N. Y.)

Rank in popu-lat'n.	Cities.	Population. Census of 1900.	Supplied.	Consumption, gals. per day. Total.	Per consumer.	Average annual receipts— Total.	Per consumer.	No. of taps.	Taps metered, Meters in use.	Per cent.	Meters frnshd and set.*	
87.	Akron, O.	42,728	20,000	.....	200	Private.	...	4,276	400	9.35	D	D
40.	Albany, N. Y.	94,151	95,000	18,100,000	191	$292,000	$3.07	16,500	2,030	12.30	D	B
113.	Allentown, Pa.	35,416	37,000	4,357,000	118	61,800	1.70	.....	17	....	C	C
90.	Altoona, Pa.	38,975	37,900	.....	95	68,000	1.79	8,496	225	2.64	D	C
43.	Atlanta, Ga.	89,872	65,000	5,444,000	84	133,800	2.06	9,275	8,500	91.64	C	C
148.	Atlantic City, N. J.	27,838	28,500	.....	80	110,000	3.86	4,249	3,298	77.62	D	D
135.	Auburn, N. Y.	30,345	.....	4,500,000	148	75,000	4.47	5,000	400	8.00	D	D
6.	Baltimore, Md.	509,000	576,000	56,000,000	97	950,000	1.65	110,000	1,607	1.46	C	C
150.	Bay City, Mich.	27,628	17,000	3,000,000	177	45,000	2.65	2,200	826	37.54	D	C
124.	Bayonne, N. J.	32,722	.....	3,071,000	94	139,000	4.25	3,000	3,000	100	C	C
93.	Binghamton, N. Y.	39,647	.....	5,936,000	156	95,000	2.47	7,000	523	7.47	B	D
5.	Boston, Mass.	560,900	.....	80,000,000	143	2,233,000	3.98	81,000	4,455	5.50	D	D
54.	Bridgeport, Conn.	70,996	70,000	16,500,000	236	Private.	...	8,000	171	2.14	D	D
92.	Brockton, Mass.	40,063	35,000	1,165,000	32	77,000	2.20	5,275	4,300	81.51	C	C
8.	Buffalo, N. Y.	352,400	400,000	92,365,000	233	650,000	1.62	64,638	1,049	1.62	..	..
133.	Butte, Mont.	30,470	45,000	.....	100	Private.	...	5,531	341	6.17	D	D
41.	Cambridge, Mass.	91,886	.....	.....	79	324,000	3.53	14,207	860	6.05	D	D
52.	Camden, N. J.	75,935	50,000	14,000,000	280	161,000	3.22	14,000	197	1.41	D	D
132.	Canton, O.	30,667	.....	3,750,000	122	36,000	1.17	4,300	45	1.05	B	C
157.	Cedar Rapids, Ia.	25,656	.....	3,000,000	117	Private.	...	2,800	60	2.14	D	C
68.	Charleston, S. C.	55,807	.....	1,800,000	32	Private.	...	1,750	20	1.14	C	C
117.	Chelsea, Mass.	34,072	.....	3,000,000	88	88,000	2.58	6,146	118	1.92	D	D
2.	Chicago, Ill.	1,698,600	.....	323,000,000	190	3,250,000	1.91	200,000	6,500	3.25	C	C
10.	Cincinnati, O.	325,900	.....	39,600,000	121	764,000	2.34	36,000	2,745	7.63	C	C
7.	Cleveland, O.	381,800	420,000	66,900,000	159	766,000	1.82	63,632	3,143	4.94	B	C
28.	Columbus, O.	125,560	100,000	23,000,000	230	165,000	1.65	14,608	4,960	33.95	C	B
156.	Council Bluffs, Ia.	25,802	.....	2,000,000	78	Private.	...	2,761	557	20.17	B	C
86.	Covington, Ky.	42,938	.....	2,500,000	58	75,000	1.75	5,300	4,150	78.30	D	B
114.	Davenport, Ia.	35,254	20,000	3,000,000	150	Private.	...	4,000	1,500	37.50	D	D
45.	Dayton, O.	85,333	.....	5,300,000	62	133,000	1.56	12,000	5,600	46.67	D	B
25.	Denver, Colo.	133,859	100,000	.....	300	Private.	...	23,549	282	1.19	C	C
59.	Des Moines, Ia.	62,139	.....	3,000,000	48	Private.	...	7,499	4,289	57.19	D	C
14.	Detroit, Mich.	285,700	306,055	44,800,000	146	465,000	1.52	55,340	5,555	10.04	D	D
107.	Dubuque, Ia.	36,297	.....	2,500,000	69	74,000	2.04	1,980	125	6.31	C	C
72.	Duluth, Minn.	52,969	15,000	4,100,000	273	133,000	8.87	2,795	1,261	45.11	C	C
158.	Easton, Pa.	25,238	25,000	2,000,000	80	.....	...	2,200	100	4.55	D	D
112.	Elmira, N. Y.	35,672	20,000	4,500,000	225	Private.	...	4,000	612	15,30	D	D
73.	Erie, Pa.	52,733	.....	7,458,000	142	139,000	2.64	11,163	266	2.38	D	D
64.	Evansville, Ind.	59,007	.....	8,000,000	136	76,500	1.30	5,367	12	0.21	D	D
33.	Fall River, Mass.	104,863	104,500	3,805,000	36	168,600	1.61	6,943	6,544	94.25	C	C
128.	Fitchburg, Mass.	31,531	25,000	3,000,000	120	68,500	2.74	4,437	2,427	54.70	B	B
83.	Fort Wayne, Ind.	45,115	.....	3,500,000	78	55,000	1.22	7,804	1,400	17.94	C	B
151.	Fort Worth, Tex.	26,688	30,000	3,000,000	100	84,266	2.81	3,209	247	7.75	D	B
153.	Gloucester, Mass.	26,121	.....	950,000	36	76,000	2.91	2,817	56	1.99	D	C
44.	Grand Rapids, Mich.	87,565	.....	13,693,000	156	125,946	1.44	8,901	1,193	13.40	?	B
77.	Harrisburg, Pa.	50,167	57,000	8,202,500	144	115,800	2.03	12,000	4,278	35.65	B	C
49.	Hartford, Conn.	79,850	80,000	8,500,000	106	250,000	3.12	9,351	2,550	27.27	D	D
104.	Haverhill, Mass.	37,175	38,000	.....	95	96,400	3.01	5,300	550	10.38	D	C
82.	Holyoke, Mass.	45,712	45,700	.....	..	90,042	1.97	3,610	210	5.82	C	D
21.	Indianapolis, Ind.	169,164	.....	13,400,000	79	325,000	1.92	10,046	600	5.97	C	C
159.	* Jackson, Mich.	25,180	.....	.....	100	30,000	1.19	3,300	400	12.12	D	D
142.	Jacksonville, Fla.	28,429	20,000	2,136,000	107	53,649	2.68	2,335	1,154	49.42	D	D
17.	Jersey City, N. J.	206,433	200,000	32,020,000	160	838,000	4.19	25,000	500	2.00	D	D
111.	Johnstown, Pa.	35,936	33,000	4,750,000	144	Private.	...	4,100	40	0.98	D	D
137.	Joliet, Ill.	29,353	.....	3,000,000	102	.....	...	2,500	300	1.20	C	C
22.	Kansas City, Mo.	163,752	.....	.....	62	420,000	2.56	13,000	5,200	40.00	C	C
76.	Kansas City, Kan.	51,418	.....	4,301,000	84	Private.	...	2,370	750	31.65	C	C
125.	Knoxville, Tenn.	32,637	23,400	2,800,000	120	Private.	...	4,250	380	8.94	B	B
140.	La Crosse, Wis.	28,895	29,000	5,585,000	193	33,150	1.14	3,300	40	1.21	C	B
90.	Lancaster, Pa.	41,459	.....	6,000,000	145	103,000	2.48	6,000	500	8.33	B	C
57.	Lawrence, Mass.	62,559	57,200	3,204,000	56	103,600	1.81	5,926	4,386	74.01	C	C
152.	Lexington, Ky.	26,369	.....	1,250,000	47	Private.	...	1,500	1,482	99.47	C	C
91.	Lincoln, Neb.	40,169	25,000	2,000,000	80	40,000	1.60	3,550	2,000	56.34	C	B
36.	Los Angeles, Cal.	102,479	90,000	17,000,000	189	Private.	..	22,000	600	2.72	B	D
18.	Louisville, Ky.	204,731	160,000	.....	100	557,000	3.48	20,755	1,560	7.52	D	C
39.	Lowell, Mass.	94,969	94,000	8,000,000	85	202,000	2.15	10,634	5,586	52.53	C	B
55.	Lynn, Mass.	68,513	73,000	4,660,000	64	210,000	2.88	12,577	2,500	19.88	B	D
120.	Malden, Mass.	33,664	.....	1,700,000	50	112,000	3.33	6,426	2,935	45.67	D	D
65.	Manchester, N. H.	56,987	.....	3,500,000	61	138,000	2.42	5,500	3,700	67.27	D	D
115.	McKeesport, Pa.	34,227	.....	2,500,000	73	50,000	1.46	3,833	754	19.67	B	C
37.	Memphis, Tenn.	102,320	80,000	10,000,000	125	Private.	...	9,666	800	8.28	D	C
15.	Milwaukee, Wis.	285,300	300,000	24,000,000	80	430,000	1.43	41,485	28,039	67.59	C	C
19.	Minneapolis, Minn.	202,718	.....	18,813,000	93	225,000	1.11	18,800	5,175	27.53	B	D
98.	Mobile, Ala.	38,469	19,500	2,800,000	144	36,300	1.86	3,890	31	0.80	D	R
47.	Nashville, Tenn.	80,865	.....	11,300,000	140	140,000	1.73	7,720	3,200	41.45	B	R
16.	Newark, N. J.	246,070	255,000	24,000,000	94	690,300	2.71	33,500	7,342	21.92	B	B
58.	New Bedford, Mass.	62,442	55,000	6,320,000	115	181,600	3.30	9,280	1,429	15.40	B	R
155.	New Britain, Conn.	25,998	25,000	.....	150	56,400	2.26	3,259	180	5.52	B	C
31.	New Haven, Conn.	108,027	.....	.....	150	Private.	...	14,500	375	2.58	D	C
13.	New Orleans, La.	287,100	.....	13,820,000	48	Private.	...	.....	....	....	C	C
144.	Newport, Ky.	28,301	.....	2,000,000	71	55,000	1.94	5,000	470	9.40	C	C
122.	Newton, Mass.	33,587	32,800	2,086,000	64	131,000	3.99	7,087	6,001	84.68	C	C
1.	New York, N. Y.	3,437,200	.....	400,000,000	116	6,200,000	1.80	.....	44,000	....	C	C
80.	Norfolk, Va.	46,624	40,000	5,250,000	131	115,000	2.88	8,500	178	2.09	D	C
56.	Oakland, Cal.	66,960	80,000	12,500,000	156	357,000	4.46	16,900	1,130	6.69	D	C
35.	Omaha, Neb.	102,555	.....	18,000,000	176	Private.	...	11,000	3,800	34.55	C	C
145.	Oshkosh, Wis.	28,284	.....	2,500,000	88	Private.	...	1,773	51	2.88	C	C
149.	Passaic, N. J.	27,777	.....	2,500,000	90	Private.	...	2,900	929	32.03	D	D
32.	Patterson, N. J.	105,171	98,000	12,600,000	129	Private.	...	11,108	2,299	20.71	D	D
95.	Pawtucket, R. I.	39,231	80,000	6,524,000	82	193,000	2.41	8,293	6,369	76.80	B	B
67.	Peoria Ill.	56,100	.....	3,500,000	62	Private.	...	6,058	418	6.90	D	D
3.	Philadelphia, Pa.	1,293,700	1,254,000	287,188,000	229	3,047,900	2.43	250,000	1,275	0.51	D	D
11.	Pittsburg, Pa.	321,600	234,000	54,000,000	231	806,000	3.44	33,084	200	0.60	C	D
42.	Portland, Ore.	90,426	90,000	18,000,000	200	286,000	3.18	12,447	509	4.09	C	D
20.	Providence, R. I.	175,597	187,300	10,130,000	54	577,587	3.08	21,566	17,813	82.60	C	D
147.	Pueblo, Colo.	28,157	15,000	4,000,000	267	62,500	4.17	3,400	30	0.88	C	D
108.	Quincy, Ill.	36,252	.....	1,650,000	46	Private.	...	2,700	1,300	48.15	D	C
139.	Racine, Wis.	29,102	.....	1,360,000	47	Private.	...	4,916	1,200	24.41	B	C
50.	Reading, Pa.	78,961	77,900	7,180,000	92	161,100	2.07	15,885	636	4.00	B	C
46.	Richmond, Va.	85,050	.....	10,048,000	100	140,000	1.65	14,781	4,500	30.44	B	D
24.	Rochester, N. Y.	162,608	.....	13,500,000	83	400,000	...	34,549	8,752	25.33	C	D
130.	Rockford, Ill.	31,051	22,000	2,600,000	118	38,900	1.77	3,373	270	8.00	D	D
89.	Saginaw, Mich.	42,345	28,000	7,500,000	268	45,000	1.61	3,500	300	8.57	D	D
4.	St. Louis, Mo.	575,200	400,000	63,530,000	159	1,483,000	3.71	65,688	4,133	6.29	B	B

23. St. Paul, Minn.....	163,065	125,000	8,337,000	67	346,000	2.77	17,093	4,812	28.15	B	C
110. Salem, Mass.	35,956	35,700	.....	70	80,000	2.24	6,400	180	2.81	D	D
70. Salt Lake City, Utah	53,531	55,000	12,000,000	218	100,000	1.82	12,000	145	1.21	D	D
71. San Antonio, Tex...	53,321	.....	8,500,000	159	Private.	...	9,100	100	1.10	B	B
9. San Francisco, Cal..	342,800	.....	25,000,000	73	Private.	...	43,000	9,900	23.02	D	D
69. Savannah, Ga.	54,244	55,000	6,000,000	109	80,000	1.45	8,000	45	0.56	C	C
127. Schenectady, N. Y..	31,682	27,000	6,000,000	222	75,000	2.78	7,000	20	0.29	D	D
123. Sioux City, Ia.....	33,111	.....	1,427,000	43	43,600	1.32	3,000	1,525	50.83	B	C
48. Seattle, Wash.	80,671	60,000	8,500,000	142	200,473	3.34	6,181	800	12.94	D	D
105. Spokane, Wash.	36,848	32,000	7,925,000	248	157,500	4.92	5,000	165	3.30	D	C
61. Somerville, Mass. ..	61,643	62,000	.....	88	210,000	3.39	10,000	200	2.00	D	D
60. Springfield, Mass....	62,059	48,200	5,471,500	113	243,700	5.06	9,764	3,122	31.97	C	C
101. Springfield, O.	38,253	33,000	3,000,000	91	43,000	1.30	4,200	200	4.76	B	D
116. Springfield, Ill.	34,159	18,000	4,000,000	222	67,000	3.72	3,000	230	7.67	C	C
129. Superior, Wis.....	31,091	.....	2,000,000	64	Private.	...	1,800	140	7.77	C	C
30. Syracuse, N. Y.....	108,374	.....	11,000,000	102	273,000	2.52	17,000	8,037	47.28	C	C
103. Tacoma, Wash.	37,714	40,000	4,000,000	100	95,000	2.37	4,500	500	11.11	D	D
131. Taunton, Mass.	31,036	26,100	1,620,000	62	60,600	2.32	4,502	1,832	40.69	C	D
106. Terre Haute, Ind...	36,673	.....	3,500,000	95	Private.	...	4,265	285	6.68	D	D
26. Toledo, O.	131,822	65,384	7,750,000	119	140,000	2.14	11,888	5,975	50.26	C	C
121. Topeka, Kan.	33,608	.....	1,900,000	56	Private.	...	2,900	550	18.97	B	B
53. Trenton, N. J.....	73,305	71,610	7,090,000	99	116,700	1.63	.....	190	....	D	D
62. Troy, N. Y.....	60,651	58,000	10,600,000	183	104,500	1.80	7,500	314	4.19	D	C
66. Utica, N. Y.....	56,383	.....	3,000,000	53	Private.	...	7,064	6,838	96.80	C	C
81. Waterbury, Conn. ..	45,859	.....	6,000,000	131	115,500	2.51	4,899	486	9.92	D	D
12. Washington, D. C...	287,700	270,000	50,000,000	185	350,000	1.30	45,000	1,200	2.67	C	C
97. Wheeling, W. Va...	38,878	.....	9,500,000	244	100,000	2.52	.....	6	....	D	D
51. Wilmington, Del. ..	76,508	76,500	6,930,000	90	162,300	2.12	15,000	640	4.27	D	D
141. Williamsport, Pa. ..	28,757	26,000	4,500,000	173	Private.	...	4,371	85	1.94	D	D
146. Woonsocket, R. I...	28,204	32,000	933,000	29	72,800	2.28	2,347	2,136	91.01	D	D
29. Worcester, Mass. ...	118,421	113,000	7,920,000	70	262,175	2.32	13,292	12,536	94.31	C	C
79. Yonkers, N. Y.....	47,931	45,000	3,627,000	81	147,944	3.29	4,968	4,852	97.67	C	C
119. York, Pa.	33,708	36,000	2,850,000	79	93,000	2.58	8,300	275	3.31	D	D

* The average per capita, consumption and receipts are based on the population supplied, where reported; otherwise, on the population by the census of 1900.

* First column is for meters furnished by (D) department or (C) consumers; second column is for meters set by (D) department, (C) consumers, or (B) both.

TABLE II.—Population, Water Consumption and Receipts for Water, Summarized and Averaged in Accordance with Percentage of Taps Metered.*

			Consumption, gallons.				Receipts.	
	No. of Cities.	Population.*	Total, daily.	Av. per consumer.	No. of cities.	Population.	Total.	Av. per consumer.
0 to 10 per cent. taps metered.....	71	12,713,866	1,947,378,000	153	53	11,802,154	$26,432,316	$2.24
10 to 25 per cent. taps metered.....	18	1,657,454	182,991,000	110	12	1,108,142	2,491,719	2.25
25 to 50 per cent. taps metered.....	22	1,686,635	175,632,000	104	17	1,448,633	3,255,149	2.25
50 to 100 per cent. taps metered.....	23	1,600,333	109,616,000	62	20	1,455,442	3,253,606	2.24
Totals and averages.....	134	17,658,288	2,415,617,000	137	102	15,814,371	$35,432,790	$2.24

* The table is based on the population supplied, where separately reported; otherwise, on the total population by the census of 1900.

In cities where the number of consumers was not given, we assumed that the total population was supplied. We understand that it is rare for a city to supply all its people with water, and to offset this over-estimate, we have taken into account that most cities have at least a partial supply received from pumps, and that the universal rule is to credit the full quantity of water calculated on plunger displacement without making any allowance for slip or leakage of pumps. The gauging of the Croton Aqueduct made by Mr. John R. Freeman, M. Am. Soc. C. E., for the Comptroller of the city of New York, shows an over statement of quantity delivered by gravity through that aqueduct, and this over statement we believe applies approximately to all such supplies. We believe, therefore the over estimate of population is equalized by the over statement of quantity supplied.

Where the total number of taps was not given we assumed one tap to six persons. These assumptions and some misunderstanding of questions by different officials may make slight differences, but the numbers used are so large that they would not materially affect the results.

In all cases cities were asked to state the number of consumers. There is a decided difference of opinion among water-works officials as to what constitutes a consumer. In the northeastern and middle states a consumer is understood to be an individual. In most of the other cities a consumer is considered a collective number of individuals, either a family or colony, supplied from a single tap. As we did not understand exactly what was meant in the several cases, we adopted the method stated above.

In regard to cost, we find $2.25 to be the anual per capita cost for water in all cities, indicating no difference, in dollars alone, to the water consumer for whatever method of charge is adopted. This is surprising, especially as it follows out in each of the metered percentage groups, and it would almost appear to be simply a coincidence. It may be explained that as the general use of water meters is comparatively recent in American cities, and that as the works were installed and the water debt incurred before the use of meters, that a sufficient time has not elapsed for them to have had their full effect on the water rates. If it is a coincidence, it shows conclusively that meter charges do not, as claimed, increase the cost to consumers.

A summary and averages of the detailed figures given in Table I. are presented in Table II., classified in accordance with the percentage of taps metered.

The results obtained are general, apply to no especial city or location, and their only purpose is to afford figures for ready comparison, and to identify the thing we have all heard of and never have seen, viz., the per capita consumption of water in American cities.

There is one result that stands forth pre-eminently, viz., that the average per capita consumption is twice as great as it should reasonably be, and that cities which are now in distress from danger of a water famine, and are consequently in search of additional supplies, can, by applying proper methods of conservation to their present supplies, more quickly and cheaply relieve themselves from their distresses, and by so doing have an abundant and adequate supply of water for twice as many inhabitants as they now have.—*Engineering News.*

—Columbus, Ohio, has recently perfected its electric fire alarm system.

AUTOMOBILE REGULATIONS IN AMSTERDAM.

THE regulations governing the speed and use of automobiles in Amsterdam, as recently adopted, are as follows:

(1) Drivers (Chauffeurs) of motor cars have to comply with the police regulations respecting riding in streets and other places with carriages having one or more wheels and other means of transporting merchandise, and with the rules on bicycling concerning riding and passing streets and places.

(2) The velocity may not be greater than that of a horse going at a moderate gait.

(3) The motor cycles must be provided with a continuous-sounding bell or a strongly blown horn.

(4) The motor shall only be used as a motive power for the cycle itself.

(5) Every cycle must be provided with two lamps throwing a clear light to front and side from half an hour before sunset until half an hour before sunrise; one of such lamps will suffice at the front of the carriage for a three-wheel cycle.

(6) Carriage may not be charged higher than 1,000 kilograms (2,200 pounds) per wheel; if the carriage weighs over 3,000 kilograms (6,600 pounds), the rims of the wheels must be at last 10 centimeters (about 4 inches) broad.

(7) Not over 10 liters (10½quarts) of oil, at the highest, may be stored in the carriage, and the oil must be stored in metal reservoirs.

(8) The reservoirs, pipes and valves must be perfectly tight to prevent leaking.

(9) The residues of the fuel must be thrown out without damage to the surroundings.

(10) The driver must be at least 18 years of age.

(11) The driver must, on first call, show his permit to the policemen.

(12) The number of the carriage, as prescribed by Government regulations, must always be visible.

CHICAGO'S MUNICIPAL LIBRARY.

So far as is known the city of Chicago is the first to establish a municipal library; it was started a year ago at the suggestion of Mayor Harrison. Encouraging progress has been made with the undertaking, and already there is a good sized collection of books, documents and papers relating to city affairs. The Mayor has struck the right idea and one which will be sure to be followed by other cities sooner or later.

Simultaneously, and coupled with it, a Bureau of Statistics was inaugurated. It is planned and carried out after that of Boston, which, in reality, is the only one in the country, for while New York has one in name it has never issued a page of statistics and apparently does nothing else but draw salaries—but it will not do that much longer. The first number of a bi-monthly, named "City of Chicago Statistics," as the organ of the library scheme, has made its appearance. It has thirty pages and a cover and is of quarto size.

PUBLIC LIGHTING IN NEW JERSEY MUNICIPALITIES.

In response to an inquiry from one of our New Jersey readers, THE JOURNAL recently sent out 110 letters to the cities and towns of 1,000 population or over in that State. Twenty-seven replies were received, the information from which is tabulated below.

Very few gave specific answers about the duration of contracts, franchises, etc. The returns relative to the city's receipts for franchises granted are meager. The only one which reports a special return from franchise privileges granted is the town of Pleasantville, which is given free light for the city buildings. There is a State law which requires the payment of 2 per cent. upon the gross earnings of all corporations serving the city, of which the State receives a liberal portion.

The town of Woodstown has neither electric nor gas light, using oil instead. Five miles of streets are lighted with eighty-six lamps at an annual expense of $900, or $10.44 per lamp.

THREE TIMES AND OUT.

THE proposed new dam which is to form part of the new system for the Troy water works was condemned in certain portions of its construction by the Consulting Engineer, Prof. William G. Raymond. Work was stopped and Mr. Desmond Fitz Gerald, the well-known Boston engineer, was called as an expert to examine the situation, and his opinion confirmed that of Prof. Raymond. Not satisfied with this, the authorities called another expert into the case, Mr. William R. Hill, Chief Engineer of the Aqueduct Commission, New York City, who went over the ground for a third time. His report confirms the report of the other engineers, and, in all probability, those having charge of the undertaking will have the specifications altered so as to conform with the changes recommended.

CONNECTICUT CIVIL ENGINEERS MEET.

THE spring meeting of the Connecticut Civil Engineers' and Surveyors' Association was held at New Haven on April 20th. The session was held at North Sheffield Hall, one of the University buildings. President Hadley, of Yale, gave a fine address, after which Mr. William Bailey, of Boston, engineer of the Eastern Expanded Metal Company, and Mr. Merrill Watson, of New York, delivered a lecture illustrated by the stereopticon, upon "Expanded Metal and Its Uses in Concrete Construction." Another illustrated lecture was given by a representative of the Westinghouse Company, on the "Power Plant of the Niagara Falls Power Company."

After the lectures the guests—about fifty in number—were taken in charge by the chief engineer of the Fair Haven and Westville R. R. Company, proceeding by trolley line to the power plant of this company, where a pair of 750 horse power dynamos are being installed, which will increase the capacity of the plant to 2,400 horse power.

The day was closed with a dinner at the Tontine Hotel. Despite the inclemency of the weather, there was a good attendance and a most enjoyable time.

NEW JERSEY LIGHTING STATISTICS.

Name of city.	Population.	Area of city in sq. m.	Miles of streets.	GAS LIGHT. No. lamps in use.	Price each, per year.	Kind of burner.	Nominal candle power.	Hours burned.	Duration of contract.	ELECTRIC LIGHT. No. of arc lamps.	Price each, per year.	Enclosed or open burner.	Nominal candle power.	Hours burned per day.	Duration of contract.
Asbury Park	4,148	1	16							87	$72.50	En.	1,200	—	5 yrs.
Atlantic City	27,838	4.20	51	172	$22.00	—	—	*		284	105.85	En.	1,600	*	5 yrs.
Avon-by-the-Sea		4	7							20	95.00	En.	1,200	7 hrs.	1 yr.
Beverly	1,950	1	14							32	95.00	Op.	2,000	12 hrs.	3 yrs.
Bayonne	32,722	—	—	853	18.50	Ord.	16	*	5 yrs.	139	100.00	—	2,000	*	5 yrs.
Carlton Hill		4	—							2	90.00	En.	—	*	5 yrs.
Camden	75,935	9.25	130	497	28.00	Wels.	—	*	1 yr.	464	120.00	Op.	2,000	*	5 yrs.
Deckertown	1,306		6		19.00	Ord.									
East Orange	21,506	4	60	350	29.00	Welsb.	—	—	3 yrs.						
Glen Ridge	1,960	1.5	13	225	17.00	Ord.	16	*	3 yrs.						
Hasbrouck Hieghts	1,253	1.5	10												
Hackensack	9,443	—	—							7	98.00	En.	—	*	3 yrs.
Jersey City	206,433	12.08	201.73	447	30.00	Welsb.	60	*	1 yr.	1,360	99.00	Op.	2,000	*	5 yrs.
Kearny	10,896	8	40							100	100.00	—	2,000	*	5 yrs.
Lambertville	4,637	2	10							42	90.00	En.	1,500	*	1 yr.
Lodi	1,917	2	7	5	16.00	Bray.	16	10 hrs.	5 yrs.						
Merchantville	1,608	0.5	7	90	24.00	—	27	*	5 yrs.						
Manasquan	1,500	—	—												
Morristown	11,267	4 or 5	—	128	21.00	Ord.	18	*	3 yrs.	17	120.00	—	1,200	*	3 yrs.
Madison	3,754	4	20												
Newark	246,070	18.5	227	2,020	19.00	Wilders'	20	*	10 yrs.	1,736	98.55	Op.	2,000	*	10 yrs.
Orange	24,141	2.2	45							308	85.00	—	1,200	*	5 yrs.
Paterson	105,171	8.56	200	432	18.00	Ord.	16	*	5 yrs.	741	102.00	—	2,000	*	5 yrs.
Pleasantville	2,182	4	12 to 15							38	50.00	En.	1,200	6 hrs.	5 yrs.
Trenton	73,307	—	—	326	25.00	Welsb.	70	*	5 yrs.	276	92.87	En.	—	*	5 yrs.
Tenafly	1,746	6	16	68	18.00	Ord.	20	*	1 yr.	1	90.00	En.	—	*	1 yr.

— Not reported.
* Sunset to sunrise.

THE PARIS GAS QUESTION.

ONE of the most important questions before the Paris Municipal Council at present and one of the most troublesome is that relating to the gas supply of the city. In 1870 a contract was made between the gas company and the city, which expires on December 31, 1905. Under the terms of this contract the capital of the company was fixed at 84,000,000 francs and dividends on this were fixed in the first instance at 13 1-3 per cent. The company was required to furnish gas for street lighting at cost, to pay 200,000 francs a year for rent of the streets for its mains, and, further, a tax of about 11 cents a thousand feet on all gas sold. After the fixed dividend and these charges were deducted, the surplus profits were to be divided equally between the company and the city. At the expiration of the contract the city comes into possession of the mains laid in the streets and may purchase the works at an appraised valuation. In return the company is relieved from payment of the octroi tax on coal, amounting to $1.50 a ton, and is allowed to charge $1.68 a thousand feet for gas.

The high price of gas and the approaching end of the contract have brought this matter prominently before the public and negotiations between the city and company began some years ago. Propositions and counter propositions have been made and a suit begun in court in regard to the clauses in the contract affecting the city's right to take the works, there being unfortunately some ambiguity in these.

At the municipal elections held last June this question was quite a factor, the socialists demanding that the city assume control of the works and operate them at the earliest possible moment, and the nationalists favoring a rearrangement and extension of the contract which should provide for the immediate reduction of the price of gas.

Negotiations took a fresh start as soon as the new council assembled, when the company presented a proposal that if an extension of their contract should be made for a long period —say fifty to seventy-five years—they would at once reduce the price of gas to $1.23 per thousand feet, and on January 1, 1906, to $1.12; would buy the city's interest in the works and at the end of the concession would turn over the entire plant to the city free of charge.

The long term suggested would of course permit the laying aside of enough to pay off the capital invested by the share holders on the expiration of the concession. This proposal was unfavorably received and various counter proposals were made, some in direct opposition and others in the nature of compromises. The socialists desired the city to use its rights without further discussions; others suggested the assumption of the works by the city on January 1, 1901, and their lease to the company for operation.

The matter, after some delay, came up in the Council in January at a special meeting and provoked a very stormy discussion, which lasted for two days. Very acrimonious speeches were made, it being charged, among other things, that the reason for the socialists' demand for the municipalization of the works was due to a desire to secure a solid body of political workers, and counter charges were made against the opponents that they were under the influence of the company.

When the matter finally reached a vote the first proposition acted on was a resolution calling for the immediate taking over of the works, and this was lost by a tie vote. Following this all the other propositions were lost by a vote of 37 to 38, and the entire matter was referred back to the committee for further consideration.

In the meantime the company is going on in the usual way, and the consumers are paying the high price of $1.68 per thousand, against $1.12 in Marseilles, Bordeaux and Lyons.

A proposal has been made that the question shall be submitted to the people in the shape of a referendum, and the newspapers have taken strong sides on this, *Le Tempo* and *Le Matin* opposing the proposal, and *Figaro* favoring it. It is proposed that only gas consumers shall be allowed to vote, but this of course is practically impossible.

The situation is an interesting one and shows what difficulties lie in the way of interpreting contracts and what complications arise when they approach their end.

KINGSTON WATER SYSTEM.

THE annual report of the Board of Water Commissioners of the city of Kingston, N. Y., shows a surplus for the year of $14,651.55 over all expenses, extensions to mains and interest on bonds. It is one of the best managed systems in the State and is a good example of what a municipal plant may become when its affairs are properly administered.

The assets of the plant, including construction, material and supplies, cash on hand and uncollected water rents, foot up to $833,640.50. The liabilities are: Bonded indebtedness, $750,000; accrued interest, $9,310; surplus account, $74,330.50, or a total of $833,640.50.

The service was put to a severe test during the extended drought of last year, but by resorting to extreme methods and the forcing of portions of the outfit the demand was met. The average rainfall for this part of the State is forty-eight inches and that of the past year was 43 per cent. below the average. The total consumption for the year amounted to 1,039,168,846 gallons; daily average, 3,847,037 gallons; daily per capita average, 109 gallons.

EXCELLENT SHOWING FOR METERS.

THE water works of the city of Harrisburg, Pa., are widely known among members of the American Water Works Association and elsewhere because Mr. Edmond Mather is the President of the Board of Commissioners and the real working head of the system. As is well known it is due to his energetic and painstaking supervision that the plant has prospered so continuously. The report for the last fiscal year shows total receipts of $106,353.67, the highest in the history of the plant, and expenditures amounting to $31,687.22.

The use of meters has been constantly urged by the president, of which there are now 4,260 in service. During the year it was necessary to repair 319 meters, and the total cost for keeping the 4,260 meters in repair for the year was only $442.95, or about 1 per cent. of their value.

The average rainfall in Harrisburg for the past twelve years has been 38.43 inches; the total for the past year was 28.94 inches.

Department of Public Safety

FIRE POLICE HEALTH

LIFE SAVING IN THE FIRE DEPARTMENT.

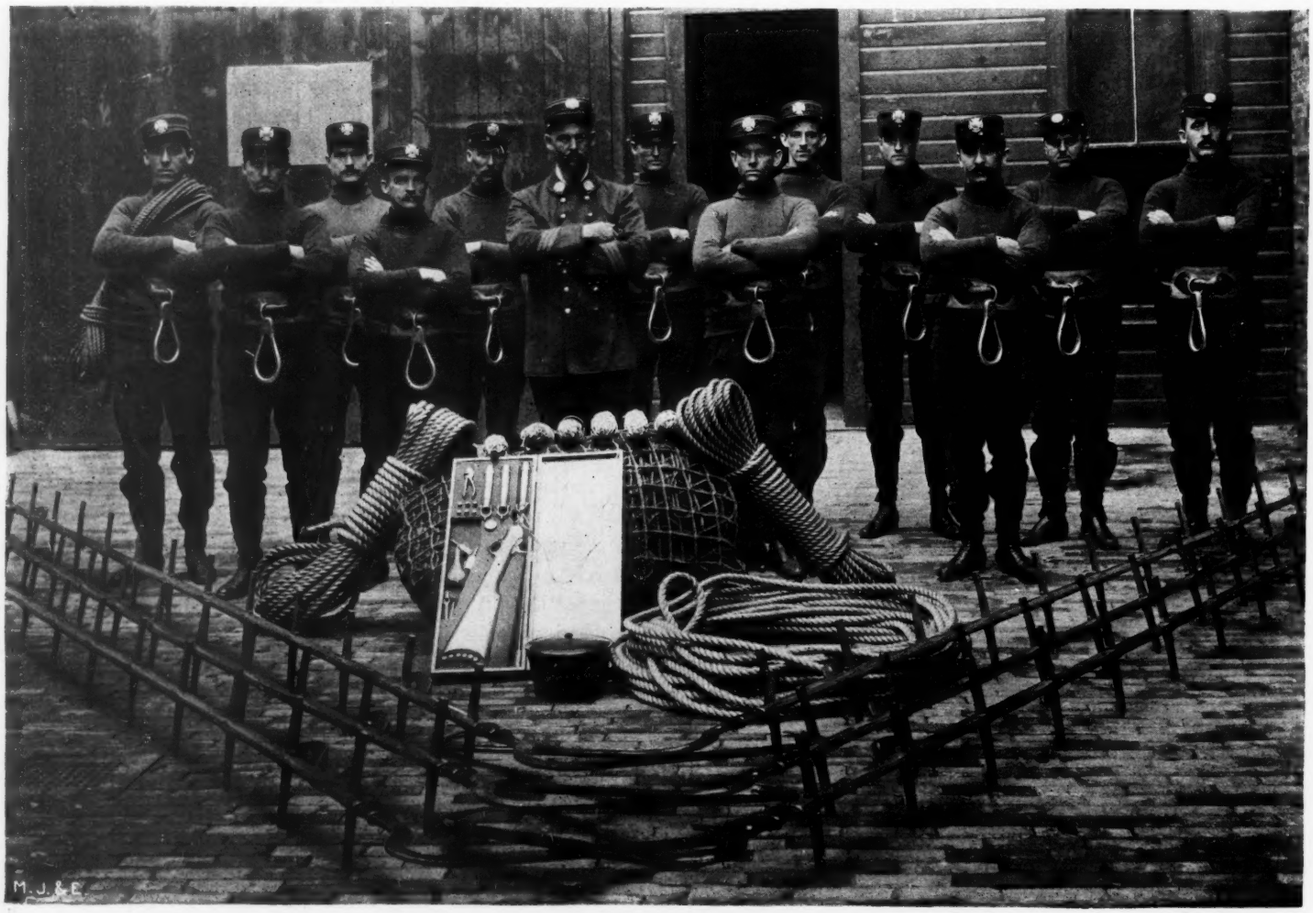
THE fire departments, or brigades, as they are called, of the old world, particularly of the larger cities of Great Britain, give much more attention to the life saving work than those of American cities. Elmira and Syracuse, N. Y., and Charleston, S. C., are exceptions to the rule. For years the Metropolitan Fire Department has maintained, at large expense, a school for the training of raw recruits, not only in the science of fighting fire, but also how to climb up the face of a twenty-story building, perpendicularly or from side to side, by using the scaling or "pompier" ladder. The New York method has become so famous that the more progressive of the smaller cities are taking it up and sending men to New York to take the course of training.

The city of Elmira was the first to take the step. Syracuse and Charleston followed, and now the men of these departments are as well trained in the art of saving life as in fighting fire, and the new schools compare favorably with the mother school in New York.

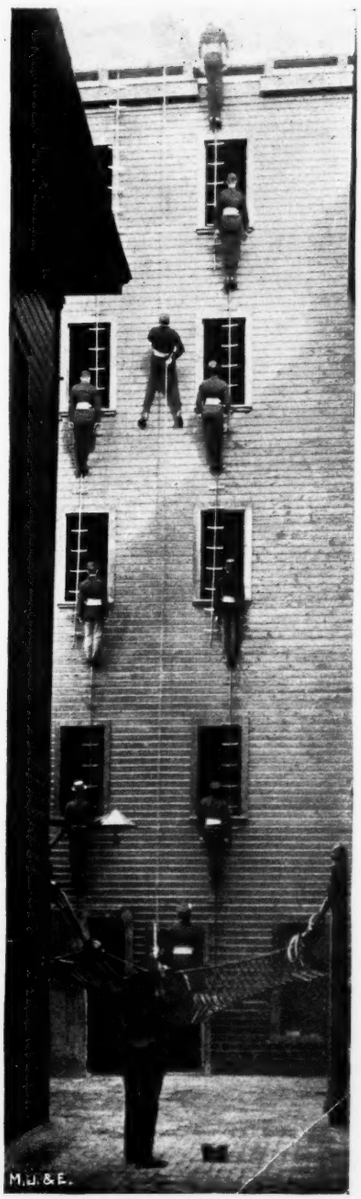
Early in 1899 Chief John P. Quigley, of the Syracuse department, detailed Captain Chester Clapper to go to New York and take the course of training, and the Syracuse school was organized by him in September of that year. The first thing necessary was the erection of a suitable building for practice. Accordingly a five-story frame building was erected in the rear of one of the engine houses. The first two stories are devoted to the horse hospital of the department, and the other three to the training school. The illustrations will tell the story much better than words, and, as will be seen in one of them, a large net is stretched out in front of the building used for practice, as accidents sometimes happen to raw recruits. But these are not frequent, for Captain McAdams, of the New York school, who has been in the work for nineteen years and trained thousands of men, has only had two accidents in all that time.

CHIEF JOHN P. QUIGLEY, Syracuse.

The apparatus used by the school is shown to advantage in one of the illustrations. What are known as "pompier" ladders are seen in the foreground, arranged in the form of a triangle. They consist of 15-foot lengths of narrow and very tough hickory, with a 2-foot steel hook on one end and



CLASS IN LIFE-SAVING SCHOOL, SYRACUSE FIRE DEPARTMENT—CAPTAIN CLAPPER IN THE CENTER.



SYRACUSE LIFE-SAVING SCHOOL—THE CLASS AT WORK.

stout hickory crossbars every foot of the length. Inside, the hook is armed with sharp teeth.

Upon the expert use of these rather frail looking ladders often depends human life. A three weeks' training in the school fits a man to climb up or across, the tallest building in Syracuse or any other city, in an incredible short space of time. Two men will start from the ground, with a ladder apiece, and climb to the top of the five story building in less than three minutes. The illustrations show how it is accomplished.

If a fireman who has been working on the roof of a blazing building has been shut off by the burning of his ladders the pompier ladder cannot be used and the Captain gets his gun. It is shaped like an ordinary cavalry carbine, but it is much heavier, the stock being of solid steel. Over the muzzle is fixed a steel cap, to one end of which a verystrong and light line is fastened. The line lies coiled in a tin dish, with a core in the centre, like a cake tin. When the gun is discharged the cap flies over the burning building carrying the line with it, which is picked up by the fireman on the roof, who pulls up a stronger rope. This is made fast to the chimney, or some other safe fastening. Then he puts on a broad webbed belt, to which is fastened an immense steel hook or snap, takes two half hitches of the rope around this hook and lowers himself over the roof. By grasping the rope with his right hand and the hook with his left, he can lower himself at any speed desired.

When there is an unconscious man on the roof to be lowered, the operation is somewhat different. The rope is placed around him so that it forms a cradle, from which it is impossible for him to slip, when he is lowered to the ground.

It takes but a slight stretch of the imagination to vividly picture the burning of a building, hotel, factory, or apartment house, with perhaps scores of human lives endangered, when the life saving corps of the fire department would perform heroic work and save the last life that was in danger. Such events seldom occur even in great cities, but when they do it is well to be prepared for them, especially when the cost for the equipment and maintenance is so slight.

There is no department better trained for this class of work than that of Syracuse. That city has good reason to be proud of its chief, who is one of the best-trained firemen in the country, and of its department.

Chief Quigley, in referring to the training school, said: "All the members of the department under the age of forty-five are eligible to the course of training in this school. Each month I have a different class, which is usually limited to ten men, so that ultimately the entire force will receive the the business, such as making and breaking couplings, carrying lines of hose to the upper floors of this building, etc. benefits of the practice. The drill consists of not only the use of the life saving apparatus, but also of all branches of Three times each month our hook and ladder companies are required to attend this drill school, when they are given special instruction in the use of the special apparatus and also in raising and lowering ground ladders. This practice keeps the men perfectly familiar with all pieces of apparatus and is sure to bring out the best methods in handling them. This school is a great success, and it is an institution which no paid fire department can afford to be without."

SYRACUSE LIFE-SAVING SCHOOL—FROM WINDOW TO WINDOW.

BALTIMORE'S DEPARTMENT.

BALTIMORE'S fire department is not wholly adequate to the needs of that city, but is modern in its equipment and efficiently officered and manned. The salaries paid are below the average of the large cities, and the pension arrangements are not conducive to the best work by the members of the department.

SYRACUSE LIFE-SAVING SCHOOL—HOW TWO MEN COME DOWN A ROPE AT ONE TIME.

At present there are 410 men in active service in the department, which is controlled by a Board of Fire Commissioners appointed by the Mayor. The present Chief, who has held the office for five years, is William C. McAfee. Under him are six district engineers, each assigned to a district. The city maintains no repair house, all work of this kind being done by private firms under the direction and supervision of the department's superintendent of machinery, whose duty it is to see that all equipments and appliances are in good repair.

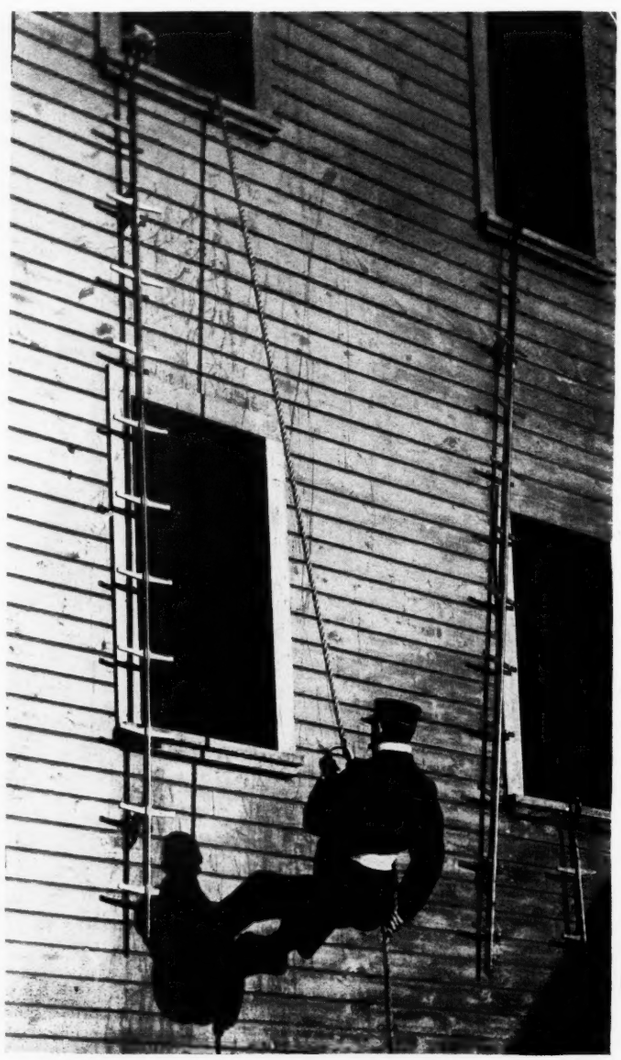
The pay of the men in the department, as stated, is small, comparatively speaking. The chief is paid $2,000 a year, the district engineer and the superintendent of machinery $1,400 a year each, captains of companies $1,100 a year, lieutenants $1,000 a year, engine men $1,000 a year, and assistant engine men (firemen) $1,000 a year, hostlers (drivers) $900 a year, and pipemen $800 a year. Besides, twenty probationers are paid $500 a year. After twenty years' service in the department, if a member becomes disabled, either by accident or sickness, he is retired on a pension of half-pay. The city carries insurance policies for the members of the department against accident or death by accident. When injured $5 a week is paid by the insurance company, while the city allows full pay for a year's time, when the disabled man is dropped from the roll. In ordinary illness full pay is allowed for six months, and then the member is dropped. In case of death by accident, the insurance policy of $1,000 is paid to whoever is designated by the insured. There is no preparatory training for the members except that gained in active service, although there are three drills each day in the various houses.

For the betterment of the service, it is proposed to erect a new truck house, moving one of the present companies to a more desirable district, and a building lot is now being negotiated for. A new engine company is to be equipped and installed in one of the resident districts. Besides this an appropriation has been proposed, and will probably be made by the Council, on the recommendation of Chief McAfee, for an experimental pipe line from the harbor to and through the business portion of the city. The sum of $3,000 is asked for the experiment, and if the line is found to work advantageously, it will be considerably extended. Pressure will be furnished by the fire boat.

WASHINGTON'S FAMOUS FIRE FIGHTER.

CHIEF ENGINEER JOSEPH PARRIS, of the Washington Fire Department, is one of the oldest and most capable fire fighters in the United States. He has been in the volunteer and paid departments forty-eight years, and a member of the paid department thirty-three years, except for two years (1868-70) when he temporarily resigned. For the past fifteen years he has been Chief Engineer of the department, and, it is reported, intends to sever his connection with what has been his life work on July 1st next.

To Chief Parris is due most of the praise for the present efficiency of the Washington department, and his loss will be greatly felt. While the general efficiency and equipment of the Washington department is commendable there is a lack in some particulars which Chief Parris recognizes, and he has done all in his power to remedy.



SYRACUSE LIFE-SAVING SCHOOL—COMING DOWN A ROPE.

SYRACUSE LIFE-SAVING SCHOOL—LOWERING A COMRADE.

Congressa ppropriates the money, and alone has the authority to increase the size of the department and fix the pay of its members, and it has failed to do all that the Chief has recommended. At the late session it increased, to some extent, the pay of the men, and after July 1st privates will be paid $840 a year, instead of $800 as heretofore, and drivers and fivemen $900, instead of $840. An extra assistant chief has been provided for, making three instead of two.

While Chief Parris has endeavored to secure appropriations for new and much needed apparatus, he only succeeded in securing an appropriation for a chemical engine house, plans for which are being prepared and bids for the construction of which will be asked after July 1st. The house is to cost $25,000.

READING'S VOLUNTEER FIREMEN.

It is, no doubt, owing to just reasons, other than those of local pride, that the citizens of Reading, Pa., point to their volunteer fire department. It is efficient and well equipped. This year the city will be redistricted and a new house built on a lot recently acquired, to cost $11,000. No new equipment will be needed. The equipment of the department at present consists of two trucks, five chemical engines, two steamers and five combination chemical and hose wagons. The city furnishes the department with apparatus and the companies purchase their own hose and horses. A gratuity of $2,000 a year is allowed each steamer company by the city, $2,200 a year to each hose and chemical company, $2,400 a year to each truck and chemical company and $1,400 a year to the ambulance service which is operated by the fire department.

Three combination hose and chemical wagons and a supply wagon have been recommended as additions to the department by Chief Miller, but it is hardly probable that the recommendation will be heeded.

FIRE DEPARTMENT ITEMS.

—The firemen of Grand Rapids have had their pay raised.

—Chief Croker, of New York, is reported as being strongly opposed to the shirt waist fad for firemen.

—Hanover, Germany, is to have three automobile fire engines, provided they prove satisfactory during the designated trial period.

—Recent experience in the matter in New York seems to indicate that the automatic sprinkler is not a sure preventative of fire.

—Scranton, Pa., has been reorganizing its fire department, and beginning with the first of this month the paid force will have displaced the volunteer.

—Jersey City has very recently installed a fire fighting school for the benefit of the members of its department. The instructors are from the New York school.

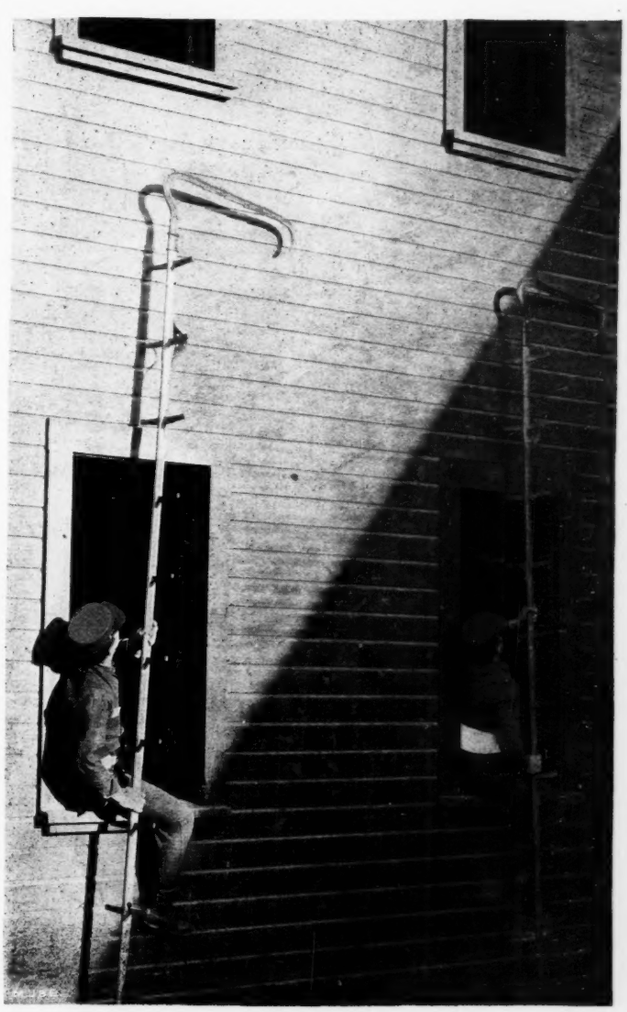
—Ill health and advanced years has led Chief W. H. Moore, of the Youngstown fire department, to hand in his resignation. W. H. Soller is apt to be his successor.

—Miss Yetta Overton has been made an honorary member of the Bayport, L. I., N. Y., fire department because of the efficient manner in which she turned in an alarm.

—Henry Geise, of Philadelphia, has invented a hose conduit for leading under trolley tracks. When not in use it is covered with an iron cap lying flush with the street.

—Chief Jos. Parris, for thirty-three years a member of Washington, D. C., fire department and chief since 1886, has handed in his resignation, to take effect May 1, 1901.

—Morris W. Mead, Superintendent of Bureau of Electricity, Pittsburg, Pa., who is also President of the International Municipal Electricians, was recently in New York arranging for a meeting of the executive committee at Niagara Falls. From the session of this committee F. C. Mason wires us that the convention will be held in Natural Food Company's hall at Niagara Falls, Sept. 2d, 3d and 4th. and hauls it to the fire.



SYRACUSE LIFE-SAVING SCHOOL—USING THE SCALING LADDER.

FIRE STATISTICS—TABLE NO. I.

Cities.	Area, sq. miles.	Population.	No. of alarms.	Total No. of fires.	Confined to building.
Akron, O.	7.30	42,728	196	196	195
Allentown, Pa.	3.14	35,146	63	63	62
Altoona, Pa.	2.48	38,975	205	205	197
Auburn, N. Y.	9	30,345	85	79	77
Augusta, Ga.	4	39,441	..	..	..
Binghamton, N. Y.	10	39,647	102	102	97
Birmingham, Ala.	6.33	38,415	239	239	239
Brockton, Mass.	21.60	40,063	283	197	193
Butte, Mont.	2.10	30,470	151	151	151
Canton, O.	6.79	30,667	98	98	98
Chattanooga, Tenn.	4	32,490	200	200	197
Chelsea, Mass.	2.22	34,072	151	151	150
Covington, Ky.	2.33	42,938	133	133	133
Dallas, Tex.	9	42,638	294	294	282
Davenport, Ia.	7.89	35,254	158	152	149
Dubuque, Ia.	12	36,297	..	..	..
Elmira, N. Y.	7.40	35,672	163	158	154
Fort Wayne, Ind.	5.15	45,115	154	154	..
Galveston, Tex.	12.70	37,789	223	223	223
Haverhill, Mass.	31.71	37,175	181	181	180
Holyoke, Mass.	16.32	45,712	238	238	..
Houston, Tex.	9	44,633	296	296	277
Johnstown, Pa.	4.10	35,936	47	47	46
Joliet, Ill.	4.70	30,720	92	92	92
Knoxville, Tenn.	4.06	32,637	121	121	100
Lancaster, Pa.	4	41,459	66	66	..
Lincoln, Neb.	8.90	40,169	170	147	142
Little Rock, Ark.	11.40	38,307	173	173	101
Malden, Mass.	4.80	33,664	..	152	150
McKeesport, Pa.	4.37	34,227	203	90	87
Mobile, Ala.	8.50	38,469	159	159	143
Norfolk, Va.	3.50	46,624	164	149	144
Pawtucket, R. I.	8.94	39,231	164	164	164
Quincy, Ill.	6.25	36,252	126	123	123
Rockford, Ill.	8.10	31,051	161	161	160
Saginaw, Mich.	12.89	42,345	209	209	206
Salem, Mass.	7.18	35,956	145	134	130
Sioux City, Ia.	48	33,111	155	155	154
South Bend, Ind.	5.97	35,999	162	162	159
Springfield, Ill.	6	34,159	131	131	131
Springfield, O.	9.21	38,253	182	182	180
Spokane, Wash.	20.25	36,848	187	117	116
Superior, Wis.	38	31,091	133	115	115
Tacoma, Wash.	29	37,714	164	164	164
Taunton, Mass.	50	31,036	115	115	114
Terre Haute, Ind.	5.46	36,673	..	..	..
Topeka, Kan.	6.20	33,608	145	145	145
Waterbury, Conn.	3.75	45,859	107	77	77
Wheeling, W. Va.	4.29	38,878	121	121	119
Yonkers, N. Y.	20.93	47,931	137	137	137
Youngstown, O.	9.60	44,885	267	267	266

TABLE NO. II.

Cities.	Total value involved in fires.	Total loss thereon.	Total insurance thereon.	Total insurance loss.	Loss per capita.
Akron, O.	$1,170,650	$233,056	.....	.....	...
Allentown, Pa.	127,700	49,650	$95,600	$49,650	$1.40
Altoona, Pa.	330,000	20,613	181,300	17,301	.44
Auburn, N. Y.	.....	42,532	.....	37,888	1.24
Augusta, Ga.	.....	.....	.....	.....	...
Binghamton, N. Y	.....	45,186	204,450	40,572	1.02
Birmingham, Ala.	350,000	.....	250,000	47,000	1.22
Brockton, Mass.	3,242,758	51,208	2,553,190	60,264	1.50
Butte, Mont.	1,747,950	.....	971,075	27,583	.90
Canton, O.	254,985	35,308	.....	.....	...
Chattanooga, Tenn.	.....	84,292	428,932	77,420	2.35
Chelsea, Mass.	570,719	31,758	335,595	23,367	.71
Covington, Ky.	.....	16,192	.....	15,670	.38
Dallas, Tex.	3,243,960	276,702	2,070,374	230,433	5.40
Davenport, Ia.	1,700,000	20,356	771,990	19,084	.54
Dubuque, Ia.	.....	.....	.....	.....	...
Elmira, N. Y.	.....	41,498	375,826	38,418	1.07
Fort Wayne, Ind.	.....	178,680	485,650	160,455	3.55
Galveston, Tex.	318,950	.....	143,270	13,357	.35
Haverhill, Mass.	371,906	49,742	249,224	47,291	1.27
Holyoke, Mass.	2,613,496	345,320	1,856,625	343,911	7.52
Houston, Tex.	2,400,510	178,612	950,902	164,691	3.68
Johnstown, Pa.	406,030	45,928	336,650	38,469	1.70
Joliet, Ill.	1,216,750	33,798	224,450	33,522	1.09
Knoxville, Tenn.	878,426	114,299	610,340	114,299	3.50
Lancaster, Pa.	.....	.....	301,723	67,713	1.63
Lincoln, Neb.	1,753,691	185,701	1,079,899	143,342	3.51
Little Rock, Ark.	516,535	.....	237,625	75,000	1.95
Malden, Mass.	375,685	45,660	256,227	35,239	1.04
McKeesport, Pa.	.....	11,100	120,000	7,350	.21
Mobile, Ala.	430,672	83,202	344,537	.....	...
Norfolk, Va.	1,566,660	71,238	751,480	.....	...
Pawtucket, R. I.	.....	25,725	.....	24,525	.62
Quincy, Ill.	836,300	31,801	601,054	29,548	.81
Rockford, Ill.	903,707	8,903	717,500	8,165	.26
Saginaw, Mich.	736,978	172,296	395,400	165,000	3.80
Salem, Mass.	485,790	76,403	421,030	73,403	2.04
Sioux City, Ia.	2,046,710	60,788	1,472,782	42,344	1.27
South Bend, Ind.	237,423	93,969	211,200	61,255	1.70
Springfield, Ill.	337,950	41,221	240,590	36,491	1.06
Springfield, O.	2,380,100	13,902	991,565	.....	...
Spokane, Wash.	1,063,993	47,807	819,390	42,493	1.14
Superior, Wis.	.....	50,375	266,450	.....	...
Tacoma, Wash.	.....	38,626	197,800	28,186	.74
Taunton, Mass.	615,043	21,183	554,103	19,160	.61
Terre Haute, Ind.	.....	.....	.....	.....	...
Topeka, Kan.	779,280	67,778	364,889	62,448	1.85
Waterbury, Conn.	.....	16,642	.....	15,162	.33
Wheeling, W. Va.	.....	19,014	296,550	17,732	.45
Yonkers, N. Y.	369,285	17,154	248,200	14,851	.28
Youngstown, O.	.....	78,512	.....	66,559	1.48

THE LONDON FIRE BRIGADE.

THE London Fire Brigade is under control of the County Council, and includes a staff numbering 1,115 men. There is one chief officer, one second officer, one third officer, six superintendents, seven district officers, sixty-nine station officers, 141 first-class firemen, 128 second-class firemen, 587 third and fourth-class firemen, thirty-two probationary firemen, 127 coachmen, seventeen licensed watermen, for river engines, tug-boats, etc.

There are sixty-one fire-engine stations, one sub-station (without horses), seventeen permanent street stations where firemen are on duty night and day with fire escapes and hose-carts, 125 fire-escape stations, forty-four hose-cart stations, eight hose and ladder truck stations, and four river stations.

Its equipment of appliances consists of seven steam tugs,

A "TURN OUT"—LONDON FIRE BRIGADE.

A RESCUE ON THE ESCAPE—LONDON FIRE BRIGADE.

twelve barges to carry engines, etc., eight steam fire engines on barges, sixty-one land steam fire engines, twenty-five manual fire engines, five small manual fire engines known as curricles, seven hose tenders and escapes combined, forty-one miles of hoses, 106 hose carts, forty-nine vans for carrying fire escapes, hose and coal, two wagons for street duties, 207 fire escapes, eleven long fire ladders and 211 horses.

The chief, second and third officers receive an annual salary of $4,500, $2,500 and $1,500 respectively.

A contribution of $50,000 is paid annually by the Government toward the maintenance of the brigade, and the fire insurance companies contribute at the rate of $175 per million of the gross amounts insured by them in respect of property in London. The amount received from the companies in 1899 amounted to $152,740. The difference between these and other minor receipts and the total expenditure is borne by the taxpayers.

The total amount distributed for the London Fire Brigade in 1899 amounted to $1,169,250.

NEW ORLEANS TO THE FRONT.

THROUGH the earnest efforts of P. B. Sullivan, Esq., who is chairman of the committee on fire apparatus in the New Orleans City Council, that city has been placed in the front rank, when compared with others of its class, in relation to the equipment of the fire department. After a long fight Mr. Sullivan succeeded in persuading the authorities to purchase one of the powerful automobile fire engines which is manufactured by the Amoskeag Company, which was added to the department last year.

There was considerable opposition to its purchase, both outside and inside the department, but the majority ruled. It is expected that all opposition will be won over after a few test cases, which will demonstrate to the satisfaction of the most skeptical the practical value of so powerful an engine. There are but few of these engines in service, and none in the South besides this one in New Orleans. The others are located as follows: Boston, two; Pittsburg, one, and Hartford, one. Wherever they have been in use any length of time they have given the utmost satisfaction, and it is believed by the experienced fire fighters throughout the country that it will be a question of but a short time when the departments of the leading cities will have one or more of these powerful engines.

THE FIRST AUTOMOBILE ENGINE IN THE SOUTH—NEW ORLEANS DEPARTMENT.

This engine can throw water at the rate of 90,000 gallons per hour, and can keep it up at the same rate for twenty-four or more hours. Mr. Sullivan has figured out the relative running cost as between this engine and a three-horse hitch engine, which he states as follows:

"Cost of gasoline oil per month, $12; cost of harness, repairs to same, etc., $4.50; cost of drugs, $4; cost of horse shoeing at $1.25 per set (formerly $2.50 per set), $4.50; cost of feed, $21; cost of heating house, $4; loss by death of horses, etc., $10; total per month, $60.

"The cost of carrying from 90 to 110 pounds of steam at present is at the rate of from nine to twelve pounds of coal per hour, at a cost of $27 per month for 90 pounds of steam. This will be materially reduced when the damper of the auxiliary boiler is properly regulated, but, taking these figures, shows a clear gain of $33 per month, or $400 per annum in round figures for the horseless.

"The cost of engine repairs is not taken account of, but this would show in favor of the horseless, as, owing to its great strength, it can stand very rough usage."

MEETING OF INTERNATIONAL CHIEFS.

THE International Association of Fire Engineers, through its board of directors, has prepared the following program for its convention at Indianapolis, August 27, 28, 29 and 30, and is submitted by Secretary Henry A. Hills:

"The danger to life attending firemen when at work fighting fires, by electric light and trolley wires. What is the remedy and how can it be enforced?"

"The danger of chemical explosives, their kind and character, and what would be the best enforced method to prevent them?" Wm. McDevitt.

"Cisterns as water supply as compared with hydrants." D. J. Swenie.

"Does the present method as practiced by fire chiefs unnecessarily increase losses by water. If so, what is the remedy?" J. D. Paige.

"The necessity of regular inspection of buildings, automatic sprinklers, standpipes and fire escapes." B. J. McConnell and Chas. E. Swingley.

"Driven wells for fire purposes." J. C. Spencer.

"Upon what basis or plan should private fire departments be organized, equipped and drilled to make them efficient, and should not their chiefs be in close touch with the chief of the city fire departments?" Herbert Heston.

Intending visitors would do well to keep in mind that a question box is to afford a means of bringing up subjects not on the program.

The opening will be at Masonic Hall, 11 A. M., on the day designated.

HEALTH DEPARTMENT ITEMS.

—Filtering drinking water for school children is a sanitary measure mentioned from Moline, Ill.

—How can we enforce the "spitting ordinance" seems to be a question quite generally asked, especially as regards street cars.

—Dr. Helmer, of the Pennsylvania State Veterinary Association, declares the laws relating to the sale of milk in cities and towns inadequate.

—"Every book at the public library should be disinfected upon its return and before it is again used," says Health Officer Leick, of Cleveland, O.

—Compulsory vaccination has received a check at Lebanon, Pa., because of the opinion of City Solicitor Funck, who declares the practice unconstitutional..

—The Indiana Legislature has passed a bill which is aimed at the Christian Scientists, but a measure looking to the same end has failed with the New York law maker.

—The scope of the Marine Hospital Service has at length become so enlarged, because of a provision made by the Fifty-sixth Congress, that it is now a national board of health, in fact if not in name.

—Harrisburg, Pa., evidently believes in a timely enforcement of sanitary measures. The council recently passed an ordinance which gives its sanitary committee unlimited power, so long as it acts within the laws of the State.

—International sanitation may now be said to be a subject fairly launched, since the first treaty looking toward sanitary ends has been effected between Argentina and Uruguay. This example is one that is likely to be imitated.

—A builder in Washington recently sought to be relieved of putting in bath tubs in a building intended for a very cheap class of tenants who would not appreciate the convenience, but the District Commissioners did not grant the request.

—Director Cole, of the department of public safety, Columbus, O., is much interested in obtaining restrictive measures with regard to the vending of milk. He recommends that the city employ a competent chemist and bacteriologist to give his attention to this matter.

—Orange, N. J., recently attempted the erection of a pest-house for the segregation of smallpox patients, but before it was completed a mob of about 400 persons took the matter in hand and destroyed it with axes. Mental epidemics seem to be wholly beyond sanitation.

—Dr. H. W. Wiley, chief chemist of the Department of Agriculture, Washington, D. C., declares that raw vegetables are instrumental in carrying disease germs. This he accounts for by the fact that vegetable gardeners near large cities are accustomed to use sewer waste, household refuse and street sweepings as fertilizers.

A PROBLEM FOR BOARDS OF HEALTH.

THE beginning of the new century finds us at last in possession of a satisfactory explanation of the manner in which malaria and yellow fever are transmitted from person to person.

This had been the speculation of years, and yet no tangible proofs could be adduced in support of the various theories which had been advanced. In the case of malaria, it had long been recognized that there existed a close relationship between the existence of swamps and stagnant water and the prevalence of the disease; hence the latter received the name—paludism. There was, however, always an insurmountable obstacle to a proof that the disease depended upon the existence of swamps and marshes, namely, the prevalence of the malady in non-swampy sections, and its comparative rarity in sections where the conditions seemed almost ideal, so far as low lying, wet land was concerned.

There now reach us, almost simultaneously, the reports of a number of medical commissions from Africa, India, and the West Indies, all of which with singular unanimity of opinion show that without doubt "fever" is largely, if not wholly, contracted through mosquito "bites." This fact has long been suspected and all but proved. Now we can no

longer doubt, for not only has the disease been absolutely proved to be transmitted by these insects by actual experiment, but the organisms producing malaria (Hæmamœbidæ) have been demonstrated to exist parasitically in the bodies of mosquitoes.

Thanks to our friends, the entomologists, we are in possession of yet further information, namely, that in all probability there is only one kind (genus) of mosquito (the genus Anopheles) which is capable of harboring the parasite-producing paludal fever. This satisfactorily explains the infrequence of the disease in certain swampy and mosquito-infested regions (our common mosquitoes belonging to the genus Culex).

It is not only malaria which we must ascribe to the mosquito, for the report of the United State Yellow Fever Commission at Havana made public in the early part of January, 1901, shows quite conclusively that the connection between mosquitoes and yellow fever is clearly established. In other words, among a given number of persons under observation, all the victims suffering from this disease have been found to have been bitten by infected insects, while those who have been fortunate enough to escape the attacks of the mosquitoes have not contracted yellow fever, even though exposed to clothing and bedding direct from yellow fever patients and not disinfected.

Already our health officers have begun to adopt measures for the prevention of these diseases based upon our new knowledge. In Havana, for instance, the sanitary authorities now, as soon as a case of yellow fever is reported, screen the rooms occupied by the patient, kill all mosquitoes in the building and in adjoining buildings with the fumes of pyrethrum powder, and cover with kerosene oil all places about the building, where mosquitoes might otherwise breed. Such expedients are equally applicable to the prevention of the spread of malarial infection, but in malarial diseases we have an additional measure of prevention in the encouragement of the generl use of quinine as a prophylactic among persons exposed to infection: if such persons are immune to the disease not only will the number of cases be directly diminished, but the opportunities for the multiplication of the malarial parasite in the human body and the consequent infection of innumerable mosquitoes will be materially reduced. The education of the public to stay in doors after nightfall when in malarial or yellow fever infected regions may also count for much, but it will, it is feared, be easier to induce the average citizen to take quinine as a preventive than to induce him to surrender so much of his personal liberty as is involved in spending his evenings at home.

THE CAPITAL CITY POLICE.

THE Metropolitan Police Department of the District of Columbia consists of 571 officers and men. After July 1st, as authorized by Congress, the force will be increased by thirty-five additional members, and the inspectors will rank as captains, of which there will be four instead of three, as now. Station keepers, who have heretofore ranked as clerks, become desk sergeants, and one new precinct is established in the northern part of the District.

There is now in the course of construction a model station house, the plan of which is the work of Major Richard Sylvester, who is the head of the Police Department. This new building is two stories high, and has a frontage of seventy-five feet. The front is of brownstone, and pressed brick decorations. On the main corridor there are eight steel cells of the latest design, with walls of vitrified brick, and a padded cell for maniacs and violent "drunks." All the cells are so constructed that they can be washed out with a hose, and they are made separate and distinct from the rest of the building by heavy walls.

The office and assembly room are in the front of the building, the former being large enough for a whole platform to be lined up. There is a well-equipped gymnasium provided and a large, airy reading-room for the men on reserve, as well as three roomy dormitories. The baths are of the most modern arrangement, and will consist of showers as well as plunge. Particular care has been taken with the heating and ventilating arrangement, and hot water heat is used.

The stable for the patrol wagon is reached by a door leading from the station, and the runway for the patrol wagon extends under the building. Over the stable are sleeping-rooms for the drivers, and a sliding pole by which to descend when a call comes in. The whole building will be ready for occupancy by June.

POLICE FORCE OF BALTIMORE.

THE police department of Baltimore has for four years been under the control of a Board appointed by the Governor, and the result has been that a more satisfactory general condition of affairs exists than when the department was under direct municipal control. At least this is the opinion of observant persons in Baltimore.

In the department are 930 persons, including the commissioners, clerical help, police surgeons and matrons. The head of the department is Samuel T. Hamilton, whose title is Chief Marshal. There is one deputy chief and eight captains, each in charge of a district. Sixteen lieutenants are distributed among the various districts, and on the patrol boat. There are two patrol sergeants to seven of the districts, and seventy-nine squad sergeants. The patrolmen number 733 men, and there is a mounted police, a bicycle corps, and a harbor patrol boat.

While the police department is under the control of a State Board, its expenses and salaries are paid by the municipality. The Chief Marshal is paid $2,500 a year, and the deputy chief $2,000. Captains get $30 per week, lieutenants $25 and $23, detectives the same. Round sergeants are paid $23 a week, and squad sergeants $20. Patrolmen are given $18 a week, and probationary patrolmen $12. The whole force, including the Chief Marshal hold office during good behavior, and can be dismissed only for cause.

There is some complaint by a citizens' organization as to the manner in which selections are made from the eligible list to fill vacancies on the force. The Board does not select the men in order of their percentage, but choose from the eligible list those whom they judge best fitted for police duty. The question is to be taken into the courts.

A LESSON FOR MILK INSPECTORS.

THE necessity and value of a municipal system of precaution against the spread of contagious disease through milk supply was strongly emphasized recently in Montclair, N. J., an intelligent community of some 14,000 inhabitants. The local Board of Health maintains strict surveillance in all dairies supplying milk within the town limits. As soon as a number of contagious cases are reported by physicians, inquiry is made to ascertain whether they have anything in common in the supply of food or milk. When, therefore, thirteen cases of diphtheria were reported last month the trouble was at once traced to a dairy which, curiously enough, was noted for its general cleanliness and has the endorsement of a Medical Milk Commission composed of leading physicians in the county. Cultures were taken from the throats of the fourteen milkers employed in the dairy, and one of them developed the *Klebs-Loeffler,* or diphtheria bacilli. The man was apparently well and performed his duties about the dairy without complaining of illness. A few days prior thereto he had taken a number of empty milk bottles to a remote part of the farm and boiled them. These bottles had been collected in the course of the winter from houses wherein diphtheria existed. After boiling the bottles he changed his clothing and disinfected his hands before returning to the dairy, but in spite of this the disease germs found their way into his system. The Board thereupon immediately stopped the entire supply of milk to the 2,500 families consuming it daily. Next it quarantined the milkers, introduced new hands in their places and disinfected the dairy. The financial loss to the dairy company was a serious matter, but the latter co-operated willingly with the Board in every particular. Within the next five days twelve new cases were adder to the list, but like the preceding ones they were of a rather mild type, and all recovered. The disease was thus effectually stamped out and an epidemic averted which would have been widespread in its effects. The lesson taught, moreover, has led the Board of Health to require that in future no milk shall be delivered in bottles to be left at houses containing contagious disease, but that it be poured into a vessel set out for that purpose.

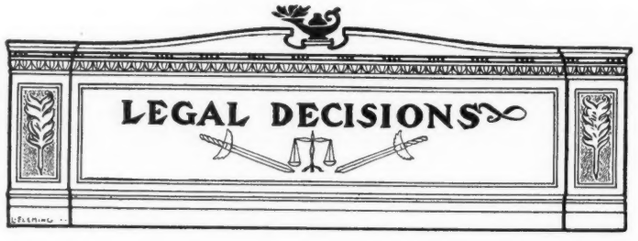
THE POLICE OF PITTSBURG.

THE only criticism concerning Pittsburg's police force is, that it is too small to properly guard the territory incorporated in the present city limits. While the city's population has, in ten years, increased from 283,000 to 321,000 inhabitants, the police force is yet the same size. There are a total of 436 persons in all departments, including the substitute, or probationary patrolmen, of whom there are fifty. The head of the department is the superintendent, or chief. He has an assistant, and under him are three inspectors. Each inspector has a district, which is in turn divided among five captains. Under the captains are ten lieutenants, who have each a squad of patrolmen and are responsible for their men's faithful performance of duty. The sixteen sergeants are in charge of the desks at the various police stations. The detective bureau, while working in harmony with the police, is under a separate superintendent and is distinct from the police department. Its superintendent is Roger O'Mara, and there are fourteen detectives under his charge.

Patrolmen in Pittsburg, of which there are 311 regulars, uniform themselves and must pass a strict civil service and physical examination before becoming a substitute, in which rank they serve four months at a salary of $60 per month. Regular patrolmen are paid $2.50 per day when on actual duty. After twenty-five years' service a member of the department may retire on a pension of half-pay, and in case of death an insurance of $1,000 is paid to his heirs.

The watches are divided into four divisions and average about nine hours each. Of each squad a certain number are designated to sleep at the station houses when off street duty and this forms a reserve force for any sudden emergency. All but one of the station houses have dormitories which are models of cleanliness, well lighted and ventilated. There are baths, both plunge and shower, reading rooms and well-selected libraries. In all but two of the stations—and these are in outlying districts—are large assembly rooms and gymnasiums, with all modern equipments. A regular series of drills under a capable drillmaster is given the men, but as yet there is no instructor for gymnasium work.

The patrol and police alarm system are thoroughly up to date, ten patrol wagons being in regular use. On each wagon which is sent out in answer to a call, and to every fire alarm, are two officers, besides the driver. Each wagon is equipped with a stretcher and a medicine chest and surgical instruments for emergency cases. Besides, there are saws and axes and a jack by which street cars may be raised from anyone unfortunately run over by them. The Bertillon system is in use and a choice collection of photographs of criminals is an interesting and useful feature of the detective bureau.



LIABILITY FOR ACCIDENT TO WORKMAN.

THE Supreme Court of Indiana, in a recent case, held that the court could not decide as a matter of law from allegations as to the size of a ditch in which plaintiff's decedent was killed by the caving of the banks and as to the nature of the soil, and the fact that dirt thrown out of the ditch was deposited on the banks and that bell holes were dug in the bottom of the ditch, that the danger was so apparent and palpable that a workman in the ditch must be held to have assumed it, where it was expressly averred that the decedent did not know of his danger nor of the digging of the bell holes; that the law implied the duty of a master to make reasonable provision for the security of his servant; that a city which was digging a trench under direction of its civil engineer might have greater facilities for discovering the danger of the trench caving than one of its servants at work in the ditch, and, if it did not, must guard against such danger by using the necessary props and braces, and that evidence of express notice to defendant's superintendent in charge of building the ditch as to the danger of caving was competent.

LIGHTING FRANCHISE VOID.

THE Supreme Court of Indiana held, in the recent case of The Gas Light and Coke Company of New Albany *vs.* City of New Albany, that where the franchise granted to a gas company by a city ordi-

nance provided that at the expiration of twenty years the city would either purchase the gas plant at the fair and reasonable value thereof at that time or grant a new franchise for another period of twenty years, the discretion so reserved could not be exercised until the expiration of the period originally fixed, and that a contract made after seventeen years, extending the franchise for twenty-three years from that time under certain regulations, must be deemed a new and independent contract and not an extension of the old one; that a contract to light the streets with gas at a certain price for twenty-three years was void as to the entire period.

LABOR UNION ORDINANCE VOID.

A RESOLUTION of the Paterson, N. J., Common Council instructing the Stationery Committee to confine all orders for municipal printing and advertising to establishments and newspapers recognizing the Typographical Union, was recently set aside by the Supreme Court as unconstitutional. Justice Fort holds t hat "a resolution which excludes all persons from entering into certain contracts except those of a specified class tends to monopoly and the imposition of additional burdens upon the tax payers and is void."

STREET RAILWAY TRACKS.

THE Supreme Court of Louisiana, in a recent decision, said: "The city of New Orleans was acting within the scope of its administrative and police power in authorizing the laying of a third rail in connection with the rearrangement of the tracks upon and the paving of one of its streets, though the question of the particular company actually laying such rail to make use of the same was involved in litigation; that whether it was advisable to lay the rail under such circumstances in order to provide against the possible future breaking up of the pavement for that purpose was a matter of legislative discretion, and that street railway companies did not own the soil of the streets of the city upon which their tracks were laid, and that their ownership of the ties, rails, etc., constituting their tracks was qualified by the fact that the city of New Orleans had the right to authorize other roads to use their tracks.

RULE FOR SALE OF FRUIT UNREASONABLE.

IN deciding validity of ordinance of the city of Chicago regulating the sale of fruit, the Supreme Court of Illinois held, that a penal ordinance prohibiting any colored netting or other material which has a tendency to conceal the true color of quality of the goods to be used for covering packages of fruit was a vexatious and unreasonable interference with and restriction upon the rights of dealers in fruit, and, therefore, void when based only on the general police powers of the city.

EXTENT OF STREET DEDICATION.

THE Supreme Court of Indiana, in a recent decision, held that laying underground telephone wires and the necessary conduits to contain them beneath the sidewalk of a street in a populous city, three feet from the property line, was not an additional servitude on the fee for which the owner of an abutting lot was entitled to compensation, and that the dedication of the street to the public left in the owner of the fee a right to make use of the land below the surface for vaults or other purposes not inconsistent with the superior right of the public to use the land for street purposes, but that such dedication gave to the public the right to make any use of the street that would facilitate communication in the daily transactions of business between citizens in different parts of the city or country, whether by traveling on foot, with horses or vehicles or communicating with each other by some means that did not involve actual passage through or along the street.

PAVING BY STREET RAILWAYS.

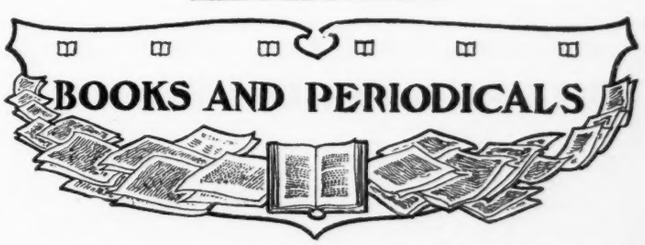
IN the case of The City of Shreveport *vs.* The Shreveport City Railway Company, et al., decided recently by the Supreme Court of Louisiana, it appeared that specific terms established the basis upon which the proportion of the whole cost of paving for which in any given case a company was to be held liable should be ascertained. The court held that it was competent for a municipal corporation and a railroad company by convention to change such basis so as to reduce the liability below that properly arising under the statute. In the case before the court an obligation with respect to street maintenance, entered into prior to the act of 1896 and predicated upon a franchise for a single-track road, having been superseded by a compromise also relating to a single-track road, and entered into after the passage of that act, and such compromise having been thereafter annulled by a contract providing for the construction and maintenance of a double-track road, the court held that the fact that the stipulation in the last contract with respect to the liability of the railroad companies for paving could not be enforced because repugnant to law did not revive the pre-existing convention on the subject, inasmuch as the surrender of the franchises for the double track was neither demanded on the one hand nor tendered on the other, but, on the contrary, was used for the purpose for which it was granted, and that under the circumstances the liability of the company for paving, as regarded both tracks, should be determined by the statute, and as thus determined was in proportion to the space occupied by their roadbeds as compared with the entire space to be paved.

A MUNICIPAL OFFICIAL.

THE Maryland Court of Appeals, in a recent decision, held that the section which provided that all municipal officials except females should be registered voters of the city of Baltimore, had no application to the position of superintendent of public instruction. The court said: "It appears from an examination of the city charter of Baltimore that the expression 'municipal official' is used to describe the heads of departments, heads of subdepartments, municipal officers not embraced in a department, and is not applicable to employees of these several departments. The mayor has the sole power of appointment of all heads of departments, heads of subdepartments, municipal officers not embraced in a department subject to confirmation by the second branch of the city council, except where otherwise provided by the charter. The superintendent of public instruction is not appointed by the mayor or joint convention, or elected by the people, but is appointed by the board of school commissioners, the head of the department of education, and is an employee of this department of the city government."

MUNICIPAL INJUNCTION.

IN the case of The United States Electric Lighting Company, recently decided by the Court of Appeals of the District of Columbia, it appeared that the appellee, an electric lighting company, filed a bill in equity to enjoin the construction of certain private conduits and pipes for electric lighting, etc., under a permit granted by the commissioners under the act of Congress of May 26, 1900, regulating permits for private conduits in the District of Columbia. The court held that there being nothing on the face of the permits to show a violation of any of the conditions or restrictions of the statute, and the act itself providing for the penalty and the mode of trial, the legal remedy was ample, and there was no occasion for a resort to equity. The court further held that whether a municipal corporation was acting or had acted within the limits of powers intrusted to it involved an examination of legal principles unmixed with equity, and that in general equity was without jurisdiction to restrain, review or set aside, even if irregular or illegal, the proceedings of such corporation.



The Report of the Board of Managers of the Municipal League of Philadelphia is a pamphlet of forty-four pages, containing an interesting account of the past year's work. Those who are interested in this class of work will find some valuable suggestions concerning

the methods employed, some of which might well be adapted to other cities. A copy, no doubt, can be had for the asking. Address, Rector McIntosh, Secretary Municipal League, Philadelphia, Pa.

The Russian Journal of Financial Statistics is a work of 716 pages with a 24-page index, octavo size. It is published annually, and the next number will appear January 1, 1902, and will contain from 800 to 900 pages, and will be sold for $5. The February, 1901, can be had for the asking by addressing G. E. Stechert, 9 East Sixteenth street, New York. The February issue contains, among other things, "Profits and Addresses of Joint Stock Companies in Russia," "Russian Railways, Receipts, Mileage, etc.," "Labor Legislation and Factory Inspection in Russia."

Public Water Supplies: Requirements, Resources and the Construction of Works. By F. E. Turneaure, C. E., and H. L. Russell, Ph.D., with a chapter on Pumping Machinery, by D. W. Mead, C.E. 8vo. XIV+746 pp., 231 figures. Cloth, $5. John Wiley & Sons, New York.

This volume, says the preface, has been prepared with particular reference to the needs of teachers and students in technical schools in which the subject of water supply receives considerable attention. For this reason there will be found little that is new to the specialist in this line, but the water works superintendent and others interested in the general subject will find much of value. It is worth a place on the library shelves of all who are connected with hydraulic engineering.

Tunneling: A Practical Treatise. By Charles Prelini, C. E., with additions by Charles S. Hill, C. E. 8vo. XV+311 pp., 150 diagrams and illustrations. Cloth, $3. D. Van Nostrand Company, New York.

This treatise is the outgrowth of the author's experience at Manhattan College, and is the third and only work in the English language which is thoroughly adapted to the needs of the technical training schools. The purpose of the book is to explain all the operations that are required in tunneling, and then illustrate by suitable examples the actual application of these methods in practice. Formulas and difficult calculations have been avoided, the book being simply descriptive, the text well illustrated, so that it can be easily understood by students and others unfamiliar with tunneling work.

AMERICAN PERIODICALS.

Foreign Bonds as American Investments. By Theodore S. Woolsey of Yale University. Seven-page article in "The Forum," New York, for May. Single number 35 cents, or $3 a year.

The Lighting of Railway Cars. By George D. Shepardson of the University of Minnesota. Five-page article in "The Forum," New York, for May. Single number 35 cents, or $3 a year.

Latest Stage of Library Development. By Ernest I. Antrim. Five-page article in "The Forum," New York, for May. Single number 35 cents, or $3 a year.

Engineering Opportunities in the Russian Empire. By A. H. Ford. Fourteen-page article, with 16 illustrations, in "The Engineering Magazine," New York, for April. Single number 25 cents, or $3 a year.

Fuel Combustion with Draft Furnished by Mechanical Methods. By W. W. Christie. Eight-page article in "The Engineering Magazine," New York, for April. Single number 25 cents, or $3 a year.

The Public Library and the Public School. By George Iles. Two-page article in "The World's Work," New York, for May. Single numbers 25 cents, or $3 a year.

Hoisting Engines. By Joseph Horner. Fourteen-page article, with 13 illustrations, in "Cassier's Magazine," New York, for April. Single number 25 cents, or $3 a year.

Police Administration. By J. A. Fairlie, University of Michigan. Twenty-three page description of the modern police system, covering: I. Evolution of the Modern Municipal Police; II. Organization of Municipal Police; III. Duties of the Police. "Political Science Quarterly," Boston, March, 1901. $3 a year.

ENGLISH PERIODICALS.

Some Cities of Modern Italy—Mantua. An editorial of about 1,000 words, appearing in the issue of March 23, 1901, of the above periodical. It gives a brief mention of the modern city and of some of its ancient features and buildings.

The Aesthetic Treatment of Bridges. An editorial criticism of a paper upon that subject, read before the Institution of Civil Engineers recently. It is commendatory, making liberal quotations, and is about 2,000 words long. "The Builder," March 16, 1901. London. Price, 19s. a year.

Aspects of Seville. An article of about 2,000 words, by Arthur Symons, briefly describing the physical features, social and religious customs of this Spanish city. "The Saturday Review of Politics, Literature, Science and Art," issue of March 23, 1901. London, W. C., price £1 10s. 4d. a year.

Music in the East End. A vivid word picture of a visit to Oxford House, Bethnal Green, London. An article of about 2,000 words. in the issue of March 30 of the "Saturday Review."

The Old Zoo and the New. The fourth and concluding article, being a caustic criticism of the present housing and treatment of the animals in the London Zoo, at the same time offering valuable suggestions as a remedy for the evil, some of which might be adapted to the needs of American zoos. Each article contains about 1,500 words. This article appears in the issue of April 6, 1901, of "The Saturday Review."

MUNICIPAL REPORTS.

REPORTS from the following municipalities have been received since our last issue:

MAYORS' ADDRESSES—David T. Dickinson, Cambridge, Mass.; Adam H. Leader, Reading, Pa.; E. S. Parkhurst, Gloversville, N. Y.; Edward Glines, Somerville, Mass.; Samuel H. Ashbridge, Philadelphia, Pa.; Johnathan D. Wilson, Newburgh, N. Y.; James K. McGuire, Syracuse, N. Y.; William D. Grant, Willimantic, Conn.; Thomas N. Hart, Boston, Mass.; C. Brooks Johnston, Norfolk, Va.; William C. Burgess, Auburn, N. Y.; Leslie Sutherland, Yonkers, N. Y.; John I. Storm, Peekskill, N. Y.; William P. Hayes, Springfield, Mass.; Alfred Moore Waddell, Wilmington, N. C.; John H. Abbott, Fall River, Mass.; Conrad Diehl, Buffalo, N. Y.; William W. French, Gloucester, Mass.; T. W. Hugo, Duluth, Minn.; Charles S. Ashley, New Bedford, Mass.; Julius Fleischmann, Cincinnati, Ohio; William C. Maybury, Detroit, Mich.; Walter B. Morse, Marlborough, Mass.; Frederick P. Burr, Middletown, Conn.; Charles S. Baxter, Medford, Mass.; Daniel L. D. Granger, Providence, R. I.

REPORTS OF WATER COMMISSIONERS—Ironton, Ohio; Harrisburg, Pa.; Erie, Pa.; Peekskill, N. Y.; Duluth, Minn.; Yonkers, N. Y.; Johnstown, N. Y.; Binghamton, N. Y.; Altoona, Pa.; Danville, Va.; Detroit, Mich.; New Bedford, Mass.; Rome, N. Y.; Cincinnati, Ohio; Steubenville, Ohio.

ENGINEERS' REPORTS—Boston, Mass.; St. Paul, Minn.; Syracuse, N. Y.; Peoria, Ill.; Baltimore, Md.

GENERAL REPORTS—Commissioners of the District of Columbia; Wilmington, N. C.; Gloversville, N. Y.; Philadelphia, Pa.; Greenville, Mass.; Rockford, Ill.; Montpelier, Vt.; Rochester, N. H.; Charleston, S. C.; South Norwalk, Conn.; Stamford, Conn.; Yonkers, N. Y.; Cambridge, Mass.; Gloucester, Mass.; Middletown, Conn.; New Bedford, Mass.; Fort Wayne, Ind.; Springfield, Ill.; Amesbury, Mass.; Alexandria, Va.; Bessemer, Ala.; Aurora, Ill.

The general city report of Boston is voluminous, comprising two large leather bound volumes. Forty-two heads are treated.

MANUELS—Somerville, Mass.; Allentown, Pa.; Trenton, N. J.; Lancaster, Pa.; Philadelphia, Pa.; Fall River, Mass.; Erie, Pa.; Buffalo, N. Y.; Providence, R. I.; Cincinnati, Ohio.

MISCELLANEOUS—Fire District, Greenfield, Mass.; Inspector of Wires, Brockton, Mass.; Report of Fire Department, Newburgh, N. Y.; Proceedings of Common Council, Terre Haute, Ind.; Journal of the Select and Common Council, Lancaster, Pa.; Commissioner of Wires, Boston, Mass.; Lamp Department, Boston, Mass.; Report of City Clerk, Washington Court House, Ohio; Buffalo Park Commission, Buffalo, N. Y.; Superintendent of Schools, Buffalo, N. Y.; Department of Public Works, Buffalo, N. Y.; Park Commission, Cincinnati, Ohio; Park Commission, Providence, R. I.; Park Commission, New Bedford, Mass.; School Report, Bessemer, Ala.; Public Lighting Commission, Detroit, Mich.; Chief's Report, Fire Department, New Bedford, Mass.; Board of Police Commissioners, Detroit, Mich.; Board of Public Works, Detroit, Mich.; Department of Public Works, Providence, R. I.

670,001—*Combined Curb and Gutter.* Stephen B. Morse, Rahway, N. J.

670,002—*Invertible Garbage Receptacle.* John C. Murphy, Evanston, Ill.

670,074—*System of Sewer Ventilation and Disinfection.* George P. Heilman, Evansville, Ind.

670,094—*Pressure Water Filter.* Edward F. Berry, Philadelphia, Pa.

670,146—*Positive Water Meter.* Leonard Burrell, Rio de Janeiro, Brazil.

670,255—*Fire Escape.* Jacob Taiz, Philadelphia, Pa.

670,335—*Meter Box.* James A. Tilden, Hyde Park, and Henry D. Winton, Wellesley Hills, Mass., assignors to the Hersey Manufacturing Co., South Boston, Mass.

670,458—*Combination Power Lawn Mower and Roller.* William P. Simpson, Overbrook, Pa.

670,570—*Bridge.* Willis F. Walker, Charlestown, W. Va.

670,605—*Dumping Wagon.* Joseph F. Chevalier, Shelbyville, Ky.

670,633—*Voting Machine.* Alfred A. Farwell, Harrison Hot Springs, Canada.

670,778—*Construction of Tunnels for Sewers, etc.* Ossian Guthrie, Chicago, Ill.

670,926—*Street Sweeping Machine.* Arthur Cameron, Chicago, Ill.

670,943—*Electric Fire Engine and Hose Carriage.* Wilbur M. Whitlock and Edgar P. Harrison, Newark, N. J.

670,968—*Road Cleaning Machine.* Henry J. Ranger, Christchurch, New Zealand.

670,983—*Locking and Releasing Means for Vehicle Brakes* (for fire engines). Charles S. Corson and Charles Schwimbersky, N. Y.

670,003—*Filter.* Marcus Ruthenburg, Philadelphia, Pa.

671,023—*Filter.* Ira H. Jewel, Chicago, Ill.

671,240—*Process of Extinguishing Fires.* Frank Shuman, Philadelphia, Pa.

671,264—*Means for Ventilating Tunnels.* Charles S. Churchill and Charles Wentworth, Roanoke, Va.

671,280—*Street Sweeper.* Joaquin Jene, Buenos Ayres, Argentina.

671,282—*Electric Meter.* Elton J. King, Fort Wayne, Ind.

671,283—*Electric Meter.* Elton J. King, Fort Wayne, Ind., assignor to General Electric Co., New York.

671,350—*Alarm System.* James H. McCracken, Washington, Ind.

671,353—*Method of Treating Sewage.* Robert H. Reeves, London, Eng.

671,429—*Water Raising Apparatus.* James E. Bacon, Richmond, Va., assignor to Bacon Air Lift Co., of New Jersey.

671,429—*Process of Making or Improving Wells.* James E. Bacon, New York, N. Y., assignor to Bacon Air Lift Co., of New Jersey.

671,438—*Trolley-Finder for Electrical Railroads.* Paul Goldsmith, Troy, N. Y.

671,492—*Apparatus for Purifying Water.* Hans Reisert, Cologne, Germany.

671,499—*Sterilizing Apparatus.* Austin M. V. Sprague, New York, N. Y.

671,514—*Trap for Pipes.* Charles R. Grinstead, Oklahoma, Okla.

671,596—*Fire-Proof Construction.* Abraham L. A. Himmelwright, New York, N. Y.

671,600—*Means for Raising Water.* Julius Kurtz, Denver, Col.

671,623—*Railway Snow Plow.* William C. Goss, Lynn, Mass.

671,627—*Dumping Wagon.* Earl P. LeGore, Philadelphia, Pa.

671,630—*Process of Making Gas.* Ludwig Mond, Norwich, England.

671,715—*System of Electrical Distribution.* Charles I. Young, Philadelphia, Pa., assignor to Westinghouse Electrical & Manufacturing Co.

671,888—*Convertible Car.* Robert K. Ingram and James K. Ingram, Lansdowne, Pa., assignors of fifty-two one-hundredths to Thomas Conway, same place, and James Haines Caffrey, Philadelphia, Pa.

671,892—*Gas Producer.* Alexander Laughlin, Swickley, Pa.

671,913—*Liquid-Meter.* Herbert Ashley, Stamford Hill, and Harold M. Martin, Westminster, England.

MUNICIPAL BOND SALES FOR APRIL.

The aggregate amount of bond sales for April in the municipal field will not exceed the total of the previous month by more than $100,000; at least that is the outlook at present writing, just before the close of the month. The cause seems to be a paucity of large bond issues in the market. The movement in small bond issues has been rather above the average, and the prices obtained have been more to the advantage of the small municipality than in former years.

One of the notable events in the month was the offering for sale on the American market of $1,500,000 worth of bonds by the city of Montreal. This is Montreal's first venture into this field, which accounts, in a measure, for the low price at which they were bid in—they were sold to a Boston firm at less than par. It is the first time, also, that that city has ever tried to sell a bond bearing only 3½ per cent. interest.

The beginning of the year promised the largest annual sale of municipal bonds that was ever known, but the falling off during the last two months, taken with the present weak market, would seem to indicate a failure to reach the high water mark of last year.

PURCHASER.	PURCHASE.	INT. RATE.	TERM, YEARS.	AMOUNT.	PRICE.
Brock, N. C., Lincoln	Blue Springs, Neb., Funding	5 per cent. s. a.	5—10 Opt.	$3,500	Par.
Bucyrus City Bank, Bucyrus	Sycamore, Ohio, Village	5 per cent. s. a.	7 Avg.	6,000	106.30
Margley, A. H.	Portland, Ore., Improvement	6 per cent. s. a.	10	10,000	102.25
Astray & McMillan	Salem, Ohio, Vine Street Grading	6 per cent. a.	1	550	101.
Citizens' Bank, Orleans	Paoli, Ind., Water Works Funding	4½ per cent.		3,500	101.014
Day, R. L., & Co., Boston	Scranton, Pa., Sewer	3½ per cent.	9¾ Avg.	135,000	102.5
Dennison, Prior & Co., Philadelphia	Marquette, Mich., Refunding Water	4 per cent. s. a.	15	35,000	104.06
Dick Bros. & Co., Philadelphia	Allegheny, Pa., School	3½ per cent.		150,000	102.91
Dick Bros. & Co., Philadelphia	Wilmington, Del., Certificates of Indebtedness	4 per cent. s. a.	1½—10½	150,000	102.217
First Nat. Bank, Harrisenburg	Suffolk, Va., Sewer	4 per cent. s. a.	30	15,000	103.
First Nat. Bank, Long Beach	Long Beach, Cal., Wharf Repair	5 per cent. s. a.	1—40 Ser.	6,600	110.666
First Nat. Bank, Princeton	Princeton, Ill., City	4 per cent. s. a.	1—12 Ser.	35,000	102.701
Flint, A. H., Local	Norfolk, Va., City	4 per cent. s. a.	30	400,000	102.27
Freshburn, J. E., Los Angeles	Orange Co., Cal., Anaheim				
Gowran, C. C., & Co., Grand Forks	Edinburg, N. D., Fire Protection	6 per cent.	15	2,000	Par.
Noble, H. E.	Portland, Ore., Improvement	6 per cent. s. a.	10	10,000	102.25
Rome Savings Bank	Rome, N. Y., Paving	3½ per cent. a.	1—4 Ser.	12,351	100.25
Stimson, Geo. A. & Co., Toronto	Tessalon, Ont., Water Works		1—30 Ser.	2,500	102.
Tichner, A.	Portland, Ore., Improvement	6 per cent. s. a.	10	5,000	103.
Wellcome, F. H., Minneapolis	Sacred Heart, Minn., School	4½ per cent. s. a.	15	12,000	103.75
Wetzel Co. Bank, New Martinsville	Magnolia, W. Va., School	6 per cent. a.	10—34 Opt.	35,000	110.
Harrel, S. B., & Co., ocal	Norfolk, Va., City	4 per cent. s. a.	30	1,500	103.
Mason, Lewis & Co., Boston	Hudson Co., N. J., Bridge	3½ per cent. s. a.	12¼ Av.	110,000	
Mercantile Trust Co., Pittsburg	Allegheny, Pa., City	3½ per cent. s. a.	30	450,000	107.52
Hayes, W. J., & Sons, Cleveland	Allegheny, Pa., City	3½ per cent. s. a.	30	448,000	107.52
Williams, C. R., & Co., Pittsburg	Allegheny, Pa., City	3½ per cent. s. a.	30	200,000	107.52
Minnesota Loan & Trust Co., Minneapolis	Madelia, Minn., Village	5 per cent. s. a.	3—7 Ser.	5,000	102.80
Norfolk Nat. Bank	Norfolk, Va., City	4 per cent. s. a.	30	214,500	101.77
Nuveen, John, & Co., Chicago	Elk Point, S. D., Water Works	4½ per cent. s. a.	10—20 Opt.	8,000	Par.
Nuveen, John, & Co., Chicago	Elk Point, S. D., Gas	4½ per cent. s. a.	5—10 Opt.	5,000	Par.
Roche, H. C., Baltimore	Norfolk, Va., City	4 per cent. s. a.	30	10,000	102.
Trowbridge & Niver Co., Chicago	Woodbine, Ia., Water Works Improvement	5 per cent. a.	10—12½ Opt.	2,000	Par.
Unknown	Memphis, Tenn., Park	4 per cent. s. a.	30	250,000	101.20
Wilkinson, L. L., Local	St. Joseph, Mich., Electric Light	4 per cent.	20	12,000	105.65
Bankers' Life Association, Des Moines	West Des Moines, Ia., Ind. School District	3½ per cent.		175,000	Par.
Campbell, Wild & Co., Indianapolis	Marion, Ind., Street Improvement			183,000	101.366
First Nat. Bank, Local	Emlenton, Pa., Sewer	4 per cent. s. a.	1—30 Opt.	16,000	101.569
Gavin, Jos. E., Local	Buffalo, N. Y., Grade Crossing	3½ per cent. s. a.	20	111,544	106.265
Hackensack Trust Co.	Hackensack, N. J., Sewer	4 per cent. s. a.	2.10¾ Avg.	10,000	101.
Hambleton & Co., Baltimore	Hyattsville, Md., Water Works	4 per cent. s. a.	30	30,000	100.083
Holmes, J. M., Chicago	Memphis, Tenn., Park	4 per cent. s. a.	30	250,000	101.48
Hudnall, E. J., Pratt City	Ensley, Ala., City Hall	6 per cent.	10	10,000	105.
Marsh, Geo. H., Van Wert	Pleasant, Ohio, Road	4 per cent.	4—20 Ser.	60,000	101.916
National Exchange Bank, Local	Springfield, Mo., Street Improvement	4 per cent. s. a.	5—20 Opt.	35,000	102.268
Parry, Will H., Seattle	King Co., Wash., Refunding	4½ per cent.	10	9,000	102.011
Rhinebeck Savings Bank	Rhinebeck, N. Y., Union Free School Dist. No. 5	4 per cent. s. a.	4—11 Avg.	3,000	104.31
Robinson, Roby, Atlanta	Calhoun Co., Ala., Court House	4½ per cent. s. a.	25	65,000	101.225
Robinson, Roby, Atlanta	Calhoun Co., Ala., Refunding	4½ per cent. s. a.	25	35,000	101.225
Scandia State Bank	Thief River Falls, Minn., Electric Light Plant	4½ per cent.	15 Avg.	7,500	102.333
Schmelz Bros.	Hampton, Va., Town	4 per cent.	40	13,000	Par.
State Bank of Woodstock	Pipestone Co., Minn., School Dist. No. 33	5 per cent.	1 1-3—15 1-3 Ser.	6,000	102.50

Construction and Supply

TRADE PUBLICATIONS.

—Charles Hvass of 509 and 511 East Eighteenth street hands us his catalogue of street sweeping machines and allied utensils. A plentiful supply of good cuts gives an adequate idea of the goods they represent.

—Catalogue A of the Erie Pump & Engine Co. has lately arrived in the "pink" of condition. It contains the list of its centrifugal pumps and also a collection of data useful in determining pump requirements.

—A "brown study" to catch the eye might be said of the catalogue of the American District Steam Co. A free use of cuts and clear statement of facts as to the goods makes the catalogue of value to one not technically educated in steam distributing appliances.

—"Cholera and Pure Water" is a caption used by the Field Force Pump Co. of Lockport, N. Y., in their catalogue to call attention to their Carter pressure water filter.

—"Are you a Buffalo?" If you are, you will, no doubt, be interested in the big buffalo shown on Buffalo Pitts Steam Road Roller Catalogue, which is well designed to give information to intending purchasers of this class of machinery.

—A catalogue of especial interest to water and steam users is that of the Caldwell-Wilcox Co. of Newburgh, N. Y. It is designed to be of practical value to those ordering such articles as steam and water pipe fittings.

—"Valves, Water Gates and Fire Hydrants" appears in silver letters on the black leatherette cover of the catalogue of the Rensselaer Manufacturing Co. of Troy, N. Y.

—Bulletin No. 36 of the Bullock Electric Manufacturing Co. of Cincinnati, Ohio, is a business-like presentation of some of its work in the way of small electric lighting and power equipments.

—"A Few Points on Garbage Disposal" is the title of a little booklet issued by the Bridgeport Boiler Work Co. of Bridgeport, Conn. It is designed to set forth the merits of Smith's improved garbage crematory.

—The attractiveness of the catalogue of the Gould Manufacturing Co. of Seneca Falls, N. Y., is no doubt designed to arrest the attention of those who have not previously learned of the efficiency of their power pumps. The catalogue contains data valuable to those working in hydraulics.

WINS OUT IN A FAIR TRIAL.

The Bardwell Votometer and the United States Standard Voting Machines were recently submitted to a severe test in the city of Worcester, Mass., where they were critically examined by expert machanical engineers, under the direction of a committee, which was appointed by the Common Council to select a voting machine to be used in some future election on trial. The result of the test is stated by the gentlemen having the matter in charge, as follows:

"Your committee has carefully examined the types of machines submitted to them, and would say that the United States Standard and the Bardwell Votometer, in their opinion, are the foremost representatives, each of a type of construction which constitute all that have been proven successful in actual work. Your committee investigated these machines in detail and sifted the mechanical and legal questions involved in the subject of machine voting to the best of their ability. A committee consisting of several of the most expert mechanics in the city were called in to aid the committee in its investigation of the mechanical construction of these machines. They were taken apart and minutely examined and investigated, and it is the opinion of your committee that the Bardwell Votometer best answers all the requirements involved in machine voting. It is simpler than the United States Standard in construction and in mechanical positiveness, it exceeds any other machine of which your committee has knowledge. It is so constructed that the liability to get out of order is reduced to a minimum, and if any mishap should occur it would be instantly discovered and easily remedied, a vital requirement, and one not embodied in the other machines."

MONEY SAVED FOR THE CITY.

The Watson Wagon Company, of Canastota, N. Y., recently received a letter from the Chief Engineer of the Electrical Commission of Baltimore, in which he makes rather a startling statement. He writes:

"You may be interested to know the experience we have had with the Watson Dumping Wagon. About a year ago we purchased ten of these wagons from you, and have had them in use ever since. The result of the use of these wagons in displacing carts has been rather startling, and I have hesitated before to publish the figures. One wagon in service hauls as much as three carts which we previously used. The cost of the cart was $2.25 per diem. We hired teams (two horses and a driver) for $3.00 per day. The cost of equal capacity in carts is $6.75 per day, which represents an actual saving of $3.75 per day in the use of wagons, or, in other words, the cost of the wagon is actually saved in something less than sixty days."

ARE YOU GOING ABROAD?

If you are going abroad be sure to select the Lackawanna Railroad as your route East. The terminus of that line is within two blocks of the docks of the ocean liners operated by the Cunard, Hamburg-American, White Star, North German Lloyd, Netherland's American, American, Red Star and French lines. To the traveler often encumbered with luggage and accompanied by his family, the advantage of landing so near his point of embarkation is at once apparent. Not only is the Lackawanna Railroad the most convenient line to the piers of the great trans-Atlantic steamers, but the comfort of its patrons is the special care of a steamship agent, who will be found on the docks of all the principal lines. From Chicago three through trains are run daily in connection with the Nickel Plate, offering a service unsurpassed in luxury and convenience. From St. Louis there is also a through daily service in connection with the Wabash Railroad.

GREAT OFFER TO FIREMEN.

You can obtain a Midget Smoke Protector for the sum of $1.50. A. W. Dolfini & Co., of Brooklyn, N. Y., have a few Midget Smoke Protectors which are shopworn, but will work as well and wear as long as new ones, which they will sell at this price.

Out of the enormous number of "Midgets" which have been sold by the above company during the past four years they have as yet received no complaints from anyone, but have on the other hand received many letters highly commending it by its users. The great success of this protector is its simplicity and reliability.

Its success has been made by itself. At a test given in Wilkesbarre, it has defeated every other American respirator by allowing the wearer to remain in the smoke a much longer time, and in Vienna, Austria, it has defeated all the European respirators in the same way, and the "Midget" is to-day adopted by nearly all the fire departments in the world.

—Michael McCabe has been elected as chief of the Haverstraw, N. Y. fire department after a friendly struggle which appears to have engaged the interest of the entire town.

—The Fire Free for All may become a feature of interest to all village horsemen. The town of Gowanda, N. Y., has hung up a purse of $5 to the person who may first get his team to the engine and haul it to the fire.

HE HAS TO BE SQUEAMISH.

The discomforts of traveling are vanishing like a mist before the light of modern genius. Distance is a foe growing less terrifying day by day, and to-day the passenger on a modern railway car can revel in luxury, and journey on from town to town with no more inconvenience than if the engine were attached to the finest hotel.

Assuredly the passenger on a train equipped with a Pullman sleeper and one of the new Lackawanna Railroad dining-cars can be content sweeping over the country, unless he is squeamish in the extreme.—*Scranton Truth.*

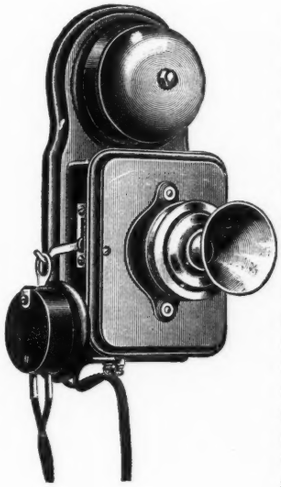
ENLARGING THE PLANT.

THE Bullock Electric Manufacturing Co., through its secretary, Mr. James Wilson Bullock, has acquired control of fifteen acres of land directly opposite the present plant at East Norwood, Ohio. Upon this tract the Norwood Foundry Co. will erect a foundry building 200 feet long by 150 feet in width, a pattern storage house, fire-proof construction, 50 x 150 feet, three stories high, and a modern office structure. All these buildings will be built of buff pressed brick with steel frames and trusses to conform to the present buildings of the Bullock Electric Manufacturing Co. The foundry will be equipped with three electric cranes, the largest of which will have a capacity of fifty tons. The side bays, which will be 25 feet in width, will be served by hand traveling and jib cranes.

The plant will be of the most modern character, and electricity will be used for power and lighting throughout.

While this foundry will be operated under the name of the Norwood Foundry Company, it will serve primarily the needs of the Bullock Electric Manufacturing Co. It will also be in position to handle outside orders in the most satisfactory manner. That it will be operated successfully is guaranteed by the fact that it will be under the direction of Messrs Hoffinghoff & Laue, of Cincinnati, a firm whose skill in handling foundry work is everywhere acknowledged.

TELEPHONES FOR PUBLIC BUILDINGS.



THE business of the modern city could not be transacted in these days without the use of the telephone; that is axiomatic. The same may be said of the business which goes on within the city building. At present, in many cities, much time is lost in running back and forth, up stairs and down, with verbal communications, which often lead to confusion, to say nothing of the time lost in the operation of such a primitive system. The business of the city would be greatly expedited and many vexatious annoyances avoided by the use of the modern telephone which has been so cleverly adapted to the needs of public buildings by The Ericsson Telephone Company, of 296 Broadway, New York. Better write for information; it can do no harm.

A NEW CONTRACTORS' PLOW.

THE great amount of excavating required in placing foundations of modern buildings, the construction of sewers and heavy grading of all kinds, together with the increasing agitation throughout the country for better roads, have made necessary the use of a plow of unusual strength adapted to this kind of work.

With this end in view, the Wiard Plow Company, of Batavia, N. Y., has brought out such a plow. While symmetrical in proportion, this is a most substantial plow, and strong enough for the heaviest contract work.

A letter has been shown us from a recent purchaser of one of these plows stating that "he has used nearly every kind of road plow made, and considers it away ahead of all of them; he has hitched eight horses to it and it stands the racket all right."

It will interest our readers to know that the Wiard Plow Works is probably the oldest continuous manufactory of plows on this continent, having been established in 1804, and that in addition to the large domestic trade there is a constantly increasing demand from foreign lands for the plows and other implements made by the Wiard Plow Company, until their representatives "go round the globe" to visit their customers in the principal cities of the world. Long experience has enabled this company to furnish plows that fill every requirement, whether for field and garden or for such heavy contract work.

LIFE SAVING NET.

THE life saving net which is manufactured by T. F. Browder & Co., of Greenfield, O., is one of the most valuable adjuncts of a fire department, especially in the large cities. Persons leaping into it do not even receive a jar. The motion of the hangers takes the jar off the person jumping and the people holding the escape. There is no

rebound, so they say who have seen it work, the hangers counteracting the effect. If these nets were used by hotels, factories, workshops and fire departments there would be less loss of human life. A few of the cities have been progressive enough to train the members of their fire departments to save life and to provide apparatus like the life saving net to be used in the training school and in actual service.

CALCIUM-CARBIDE.

AMONG the patents issued on April 16th from the United States Patent Office there appeared a simple little announcement of "a patent for improvement in electric furnaces by F. J. Patten." To the layman this fact caused no comment, as numerous inprovements in furnaces are issued from time to time, but to the electrical world the announcement was of more than passing interest. It has been known for over a year that the Columbian Carbide Company had a little joker up its sleeve, in the shape of an invention in furnaces, and that the long-sought-for continuous furnace. After a careful examination of it the electrical sharps seem to be unanimous in their opinion that it will do all that has been claimed for it. In view of this fact the success of the Columbian Carbide Company in the field of carbide manufacturing seems to be assured, and the use of acetylene gas, instead of being retarded as it has been by the high price of carbide, will grow to immense proportions.

HAVE LASTING QUALITIES.

THE "Quick-as-Wink" hose couplings which were put on the market five or six years ago by The W. J. Clark Co., of Salem, Ohio, have evidently come to stay as an improvement in fire service equipment. They seem to be giving unqualified satisfaction where they are in use on fire hose; those who have had them longest in service are most emphatic in declarations of their superiority over the common couplings.

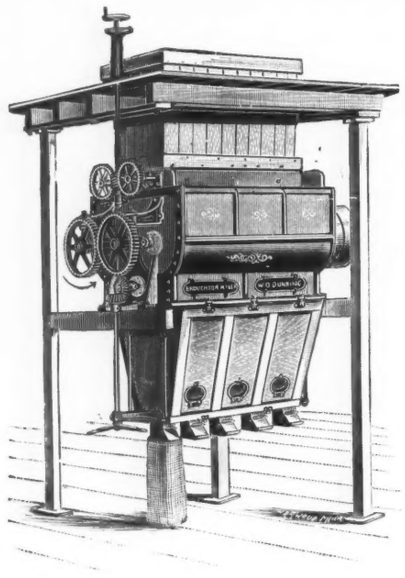
Salem and Leetonia, Ohio, Beaver Falls, Sharon, Grove City and Sharpsville, Pa., were fitted out with "Quick-as-Wink" Couplings about five years ago, and they are still in use there with pride and satisfaction. Upon inquiry of firemen and others in those places and elsewhere where the couplings have been in service long enough to thoroughly test their durability, strength, convenience and general working qualities, we learn that they have fulfilled every claim that has been made for them as an improvement over the common couplings which were previously used.

Firemen claim that they are not only much quicker coupled than screws, but more convenient, as only one man is required to make or break any connection, while two are often required when screw couplings are used. As to the matter of certainty, reliability, safety and non-leaking connections, the "Quick-as-Wink" couplings have proved equal to screws—no case is known where there has been a failure in those respects.

THE BROUGHTON MIXER.

THE "Broughton Mixer" is a machine built on honor and is a machine that does its work in a thoroughly satisfactory. It is adapted to the mixing of sand, lime, paints, fertilizer, soap powder, baking powder, and many other substances.

It is also made with screen attached to top of machine, the material being worked through by rotary brushes being driven from the



main shaft by sprocket wheels and chain and sifted to any desired fineness before being mixed.

Those who have used it speak highly of it; for instance, N. H. Culver, of Detroit, Mich., said: "We believe we have found the perfect adamant mixer in the new 'Broughton' machine. We have not lost an hour by 'breakdowns' or other annoying delays; in fact, with proper care, I do not see how the machine can get out of order, as the bearings are all outside away from dirt and dust."

TRADE NOTES.

—The city of Detroit, Mich., will soon have the finest asphalt repair plant owned and operated by any city in the world. It was constructed by Hetherington & Burner, of Indianapolis, Ind.

—The Boulevard Globe and Lamp Company has moved into the Electric Exchange Building, 136 Liberty street, from 88 Warren street, to which all communications should be addressed.

—Charles Hvass, of Brooklyn, N. Y., secured the contract recently for fifty can carriers, including cans, from the city of Troy, N. Y. The City Engineer said that the committee which investigated found these cans and can carriers the best adapted to Troy's needs, and, therefore, he recommended their purchase.

—The United States Standard Voting Machine Co., of Rochester, N. Y., is represented in Boston by Mr. A. S. Hamilton, the general sales agent of the company. He has a machine on exhibition in one of the rooms of the Old Court House, and it is attracting a large amount of attention from the press and the citizens in general.

—The Globe Asphalt Co., of Pittsburg, Pa., announces that its California plant now has a capacity sufficient to refine 122 tons of asphalt per day, or over 40,000 tons per year; equal to about one-half of all asphalt used in the United States for street paving purposes. It is known as the "Obispo" brand of California asphalt.

—At a recent meeting of the Troy Board of Public Works City Engineer Cary said, in making a motion to purchase four of the Ostler street sweeping machines: "We tried several kinds of machines last summer, and of the lot this followed the contour of the street more perfectly, swept a wider path and did better work than any of the others."

—The Southern Railway is the great developer in the sunny Southland. It is through its wonderful influence that the commercial interests, especially the cotton industries, manufacturing, etc., are being increased so rapidly. From a few mills there have sprung up along the line of this railroad more than 500, with an equipment of 117,619 looms and 4,463,493 spindles.

—The new large machine shops being erected at Elizabethport, N. J., for the Central Railroad of New Jersey, for which Mr. Geo. Hill is consulting engineer, will be equipped exclusively with the well-known Lundell power apparatus manufactured by the Sprague Electric Company. The equipment will consist of three 100 K. W. generators of 240 volts and 250 R. P. M., direct connected to Ball & Wood engines, and 75 motors of various sizes for driving the machine tools. The Lundell generators and motors have long had the distinction of being of the very highest degree of excellence in the qualities pertaining to efficiency, durability and mechanical construction. All of the motors and one generator are booked for delivery in June, and the other two generators will be delivered in July.

MINERAL WOOL

Will keep a house warm in Winter, cool in Summer, and is thoroughly deafened. Absolutely vermin proof; neither rats, mice, nor insects can make their way through, nor live in it. Checks spread of fire and prevents dampness.

SAMPLE AND CIRCULAR FREE.

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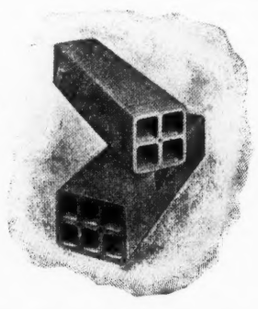
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